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Basic Business Conditions Favorable

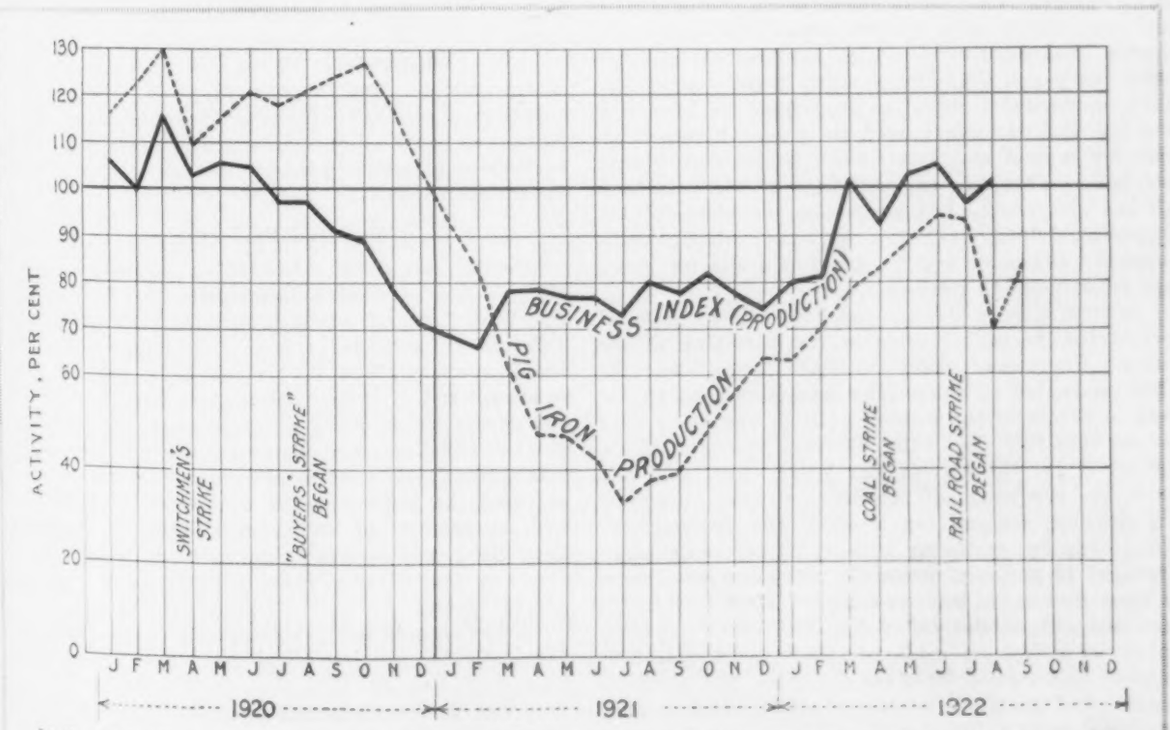
Production Running at 1919 and 1920 Rate of Activity—Iron and Steel Far Below, Due Largely to Coal and Locomotive Shortage

BY SIDNEY G. KOON

IT needs nothing more than the buoyancy already shown by general productive activity in the United States to establish its inherent soundness. After business had climbed from the doldrums of 1921 to a definite emergence, in March of this year, from the effects of the protracted slump, the coal strike beginning April 1 gave it a heavy setback. But May showed such a pronounced recovery as to push production above the figures set in March, themselves the highest since June, 1920. Then, when the railroad strike beginning July 1 dropped the curve for a second time below par, the rebound of August once more re-established it above par—which in this case is the average for the calendar year 1919.

While the curve of productive activity shown on this page is similar in general to that on page 69 of our issue for July 13, there are some outstanding differences, due mainly to the fact that the present study is based wholly on 1919. In the previous curve the base was mainly 1913; but some items, for which data so far back could not be obtained, were referred to 1917, 1919 and even, in the case of silk, to 1920. Except for silk, which has now been omitted, the items are the same, and their groupings are the same, as before. Twenty-one separate items have been used in ten groups, as shown below. The first four groups represent food, shelter, clothing and heat—the primal necessities of human life.

1—Food; beef, flour and sugar.
2—Building construction.



In the Solid Curve Is the Story of Productive Activity in the United States from the Beginning of 1920. This is represented in tons, barrels, bales and square yards—not in dollars. The figures for each month are expressed as a percentage of the average month of 1919

Pig iron production, also in tons, appears in the dotted curve, which shows how much more heavily the iron and steel industry was hit by the slump of 1921 than was industry in general

3—Textiles; cotton and wool.
4—Fuel; anthracite and bituminous coal and petroleum.
5—Vehicles; automobiles and trucks.
6—Leather; belting and sole leather.
7—Lumber; yellow pine, Douglas fir and Northern hardwoods.
8—Steel ingots.
9—Non-ferrous metals; copper, lead and zinc.
10—Newsprint paper.

Because 1919 was a year of greater activity than 1913 in every group of items, and in every single item, with the exception of coal and of lead, so far as 1913 figures are obtainable, 1919 furnishes in many ways a better present standard of comparison than 1913. Our 105,025,000 of population in mid-1919 was much closer to the 109,325,000 of Oct. 1, 1922, than was the 97,200,000 of mid-1913. The larger population of 1919 called for a larger production than in 1913—and got it. And conditions in 1922 are much nearer to those of 1919 than to those of 1913—labor in certain lines is getting a disproportionate share of the earnings of those lines—as in 1919; prices of commodities are higher now, and were higher in 1919, than in 1913, while at the same time lower than the post-war peak reached in 1920; both 1919 and 1922 have been years of unprecedented building construction; both years have had strikes of major importance which in both cases have seriously hampered the steel industry, in particular.

It may be emphasized that dollars do not enter the curve, which is a story of physical quantities, unaffected by prices or markets, except in so far as these may induce a larger or smaller productive activity. Thus, beef is expressed in thousands of pounds of inspected slaughter; flour, in thousands of barrels of wheat-flour produced; sugar, in gross tons of meltings; building construction, in square feet of floor areas built; cotton and wool, in the quantities consumed by textile mills as an index to the amount of cloth produced, etc. All averages of items into a group and of groups into the final index are direct, without giving any one a greater weight than another.

And the curve indicates, in a way difficult of expression otherwise, that we are no longer "hibernating" on the accumulated production of former years. We are again "on our own." With stocks in most lines largely and successively more largely depleted and retailers buying from hand to mouth, as has been the case for some two years, since the so-called "buyers' strike" of 1920 commenced to paralyze production, we have now reached, and probably passed, the point where production for current and future needs becomes an urgent necessity. The huge accumulations of the past have all but disappeared and production prospects for the immediate future—barring a renewal of labor troubles—appear unusually bright. Demand exists for goods and goods must be produced.

Intense activity through the first half of 1920 accounts for the high portion at the beginning of the curve. There was heavy building construction; the 1920 production of automobiles was more than 10 per cent in excess of the number built in any other year before or since; steel came within 7 per cent of the output of the three great war years, 1916, 1917 and 1918; the production of petroleum, to keep pace with the growing demand for gasoline and fuel oil, advanced rapidly, exceeding 1919 by 24 per cent; paper averaged 10 per cent above the previous year. Some of these dove-tailed into each other. Thus, both buildings and automobiles called for steel; the increasing output of petroleum made necessary large quantities of steel tanks, pipe, tin plate and other "oil country" goods. And the transportation of all this vast produce demanded more railroad cars—again calling for more steel.

All this stopped sharply in early summer. Building construction, 110 per cent in April, was 80 per cent in June, 60 per cent in July and 30 per cent in December—the latter, largely because of the season. Textiles fell steadily from 112½ in April to 49½ in December. Vehicles dropped, without a retarding movement, to 35 in December and reached low water at 19 in January, 1921. Leather fell without pause from 110 in May to 51½ the following February. Lumber was 102 in August, 69 in December. Non-ferrous metals declined from 102 in September to 50 in February. Steel, the last to be affected, was then hit by an avalanche of cancellations, and a steady fall was recorded, from 127½ in October to 51 in April and 34 in July. Food had to be produced; the people had to eat. But the 101½ of July gave place to 70 in December, January and February.

After February, 1921, the situation began to mend. The sharp recovery in March was due to food, building construction, textiles, automobiles and lumber, and to a lesser extent to fuel and leather, all of which showed marked gains during the month. From that point there was slight change for a year until, in March, 1922, another general advance took place. In this case building construction, leaping to 112 from 65 in February, led the van. Automobiles, fuel (partly in anticipation of the coal strike), lumber, paper, food, textiles, copper—all registered good gains. And steel, jumping from 74 to 100, kept pace.

To the beginning of the coal strike must be ascribed the drop in April. Fuel fell off more than half, only the heavy production of petroleum keeping it up to 61. Only buildings, automobiles and leather advanced. But the handsome recovery in May, in which every group except leather participated, more than made up the lost ground. In July, once more, labor's unwarranted demands took heavy toll from the nation's output; but recovery in August, while less complete and less impressive than in May, once more brought productive activity up above its 1919 average.

Unemployment, so live a topic in 1921, is no longer a fact. Every man who can render worthy service may have his opportunity. Shortage of labor is becoming a problem—in particular, the common labor so necessary for the rougher work in all industries. But the question now simmers down to the adequacy of transportation facilities. Hampered though they were by the long-contested strike of shopmen, the railroads report that there were 20,000 fewer "bad order" cars on their lines on Sept. 15 than on July 1, when the strike started. And the number Sept. 15 was 70,000 less than a year ago. Unfortunately, the same cannot be said as to the more complicated locomotives. Hence a shortage of motive power is now the big obstacle to the greatest activity.

Pig Iron Production

During this same period of 32 months, January, 1920, to August, 1922, both inclusive, the curve of pig iron production, as shown in the diagram, took quite a different course. Similar, in that low followed high and was succeeded by high, yet the changes in pig iron were so abrupt and so tremendous in their intensity that the two curves differ totally in appearance. General production, including steel ingots but not pig iron, had a maximum of 115.7 and a minimum of 66. The larger exceeded the smaller by 75 per cent. But pig iron, with its maximum of 130, had a minimum as low as 33. Here the larger exceeded the smaller by 294 per cent, or nearly four times as great a divergence as with the general group.

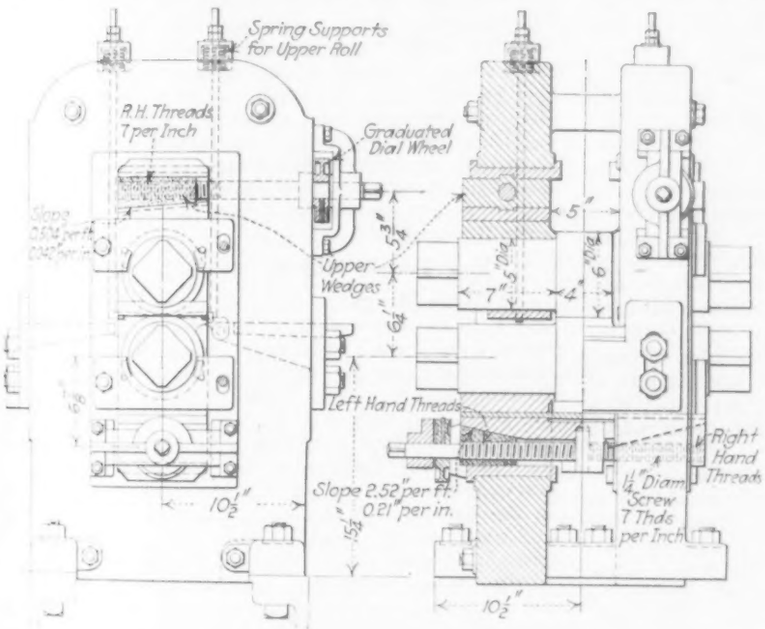
It has already been explained that steel (which in turn calls for pig iron) had been in such heavy demand until late in 1920 that the production for the year was the fourth largest in our history, and this, in spite of the sharp shrinkage of the last three months of the year. But the sudden stoppage of orders—cancellations of hundreds of thousands of tons—many of which had been filed with two or more steel producers,

(*Concluded on page* 902)

Cold Rolling Mill with Wedge Adjustment

Continuous Strip Mill of Worcester Pressed Steel Co. Has Exceptional Control for Both Gage and Speed

TWO stands of a continuous or tandem cold rolling mill for strip steel have been installed experimentally by the Worcester Pressed Steel Co., Worcester, Mass. As soon as this experimental installation has "found itself," in the sense that all of the features are functioning as well as can be desired, two more stands are to be added, making a group of four, all in tandem. Of chief interest in connection with the new mill are the methods of adjustment of rolls and of speed control.



Construction of the Mill Is Shown Clearly by the Cut at Left, the Wedges and Their Action Being Indicated

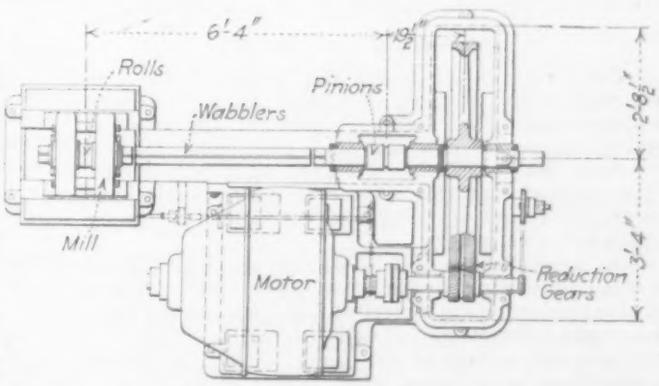
Wedges, both top and bottom, actuated by screws handled by wheels, are used for roll adjustment, and so closely has the design been worked out that the top roll moves only 0.0001 in. for each of the 60 spaces on the "micrometer" wheel and an even closer range may be obtained by splitting these spaces, which measure about ¼ in. on the periphery of the wheel. These top wedges are independent, to permit correcting any tendency of the rolls to produce a material thicker on one side than the other. The slope is only 0.504 in. per ft. (0.042 in. per in.) and the screw has 7 threads per in. Hence, one complete turn of the screw raises or lowers that end of the roll 0.006 in. These wedges operate in a direction parallel to the motion of the material between the rolls.

As the wedge adjustment for the bottom roll is designed normally for use only when changing gage, it is made much coarser and both ends of the roll are raised or lowered together. The slope of this wedge, 2.52 in. per ft., is five times that for the top roll, and a single turn on the screw which is 7 threads per in., as before, changes the position of the roll 0.030 in. In this case the two wedges are on a single screw, one end of which has right-hand threads while the other has left-hand threads. These wedges operate in a direction parallel to the axis of the roll..

Speed control between the two stands, now running, is obtained by means of a rheostat governed by hand wheels adjacent to the second stand of the mill, and within easy reach of the roller. Normally, he keeps the second stand running just fast enough to permit the stock to sag gently between stands, which are some 8 ft. apart. As the two stands are driven independently by two adjustable speed, direct current, 70-hp. Westinghouse motors, through herringbone reduction gearing, adjustment of the speed of the one motor, to conform with that of the other, is all that is necessary. Finishing speeds run from 160 ft. per min. upward. The maximum being now about 350 ft. per min., or nearly double the usual practice.

Such fine adjustment as is had on the top roll results in giving a coil of perfectly flat edge, thus avoiding the waviness in the edge of the strip, sometimes experienced with rolls less well under control. This is of prime importance for many uses of the steel, particularly when it is for tubing, where a wavy edge is troublesome in the welding machine.

Below, the Plan of a Single Stand Shows How Compactly the Whole Layout Has Been Arranged, the Entire Unit Occupying a Space About 7 x 12 Ft.



For the wedges, hardened steel is used against brass. The one feature, in this connection, which is not yet thoroughly satisfactory lies in the difficulty of tightening the wedges, and through them the rolls, while material is running through. There is so much binding, under full load, against the collar where the thrust is taken up (A, in the detail of the mill) that a ball bearing thrust is to be substituted. Ball bearings between wedges have been considered, also, but will probably not be used.

To promote precision through lack of spring in the mill, cast iron housings of extra size have been installed and, as the (chrome steel) rolls measure 6 in. in diameter by only 4 in. face, it has been found possible to get the two housing columns within 5 in. of each other. The mills were built by the United Engineering & Foundry Co., Pittsburgh, from plans developed in the Worcester plant by H. A. Fisher, works engineer.

When large reductions are required, the metal is

passed through the mill twice without intermediate annealing. This gives it four roll passes. When the two additional stands have been installed, a single operation will give the same four roll passes, with an added economy in labor, as the steel will then be handled only twice instead of four times.

Near the delivery side of the second stand is a motor-driven reel designed and built at the Worcester plant. Control of the speed of this machine is such as to permit the roller to maintain in the strip, as it is being coiled, any desired tension. A second and similar reel, which may be installed later, will permit larger tonnage, for trip coiling could be started on one reel during the time required for unloading the other, the two thus being used alternately from the same rolls.

ELECTRIC STRIP MILL DRIVE

New Features Provide Closer Control of Relative Roll Speeds

BY B. S. BEACH*

SPECIAL interest surrounds the recent installation of electrical equipment for a new 14-in. continuous hot strip mill of the Trumbull Steel Co., Warren, Ohio, described at page 1510, June 1. This equipment represents a totally new development in rolling mill drive and is the first installation of its type.

Built by the Morgan Construction Co., Worcester, Mass., the mill consists of a roughing train of four stands of horizontal mills, an intermediate train of two stands, and a finishing train of four stands. The roughing mill is driven by a 600-volt, shunt wound, direct current motor which will develop 1250 hp. at 50 deg. C. (or 90 deg. Fahr.) temperature rise, at any speed between 175 and 350 r.p.m., through reducing gears. The intermediate mill is driven by a similar motor, direct connected to stand No. 6 and, through reduction gears, to stand No. 5. The four stands of the finishing mill are each driven on individual 800-hp. motors of similar design, but different speeds, which are directly connected to the rolls.

Power to operate the whole mill is furnished by two synchronous motor generators, each consisting of a 2300-kw. 600-volt, compound wound direct current generator direct connected to a 3300-kva. 2200-volt, 60-cycle, 3-phase synchronous motor. The main shunt fields of the generators and direct current motors are separately excited from a 250-volt circuit. The electrical equipment was built by the General Electric Co.

Principles of the Control

The control which makes this drive possible does not work on the principle of maintaining a given ratio between stands, but maintains constant any speed at which a given motor is set; since each motor speed is constant, the ratio between stands must be constant. It is evident that this scheme is much simpler and more readily set up than one depending on change gears and cone pulleys.

On the shaft of each direct current motor is mounted a small alternating current "pilot" generator. The field of these generators is controlled through a voltage regulator which maintains constant excitation. Therefore the delivered voltage of any generator will be strictly proportional to its speed, which is that of its motor.

Adjustments of the speed on any individual motor are made from the pulpit of the mill by means of three rheostats, one being motor driven. The latter changes the resistance in the motor field and adjusts the voltage regulator coil circuit simultaneously. The second makes small changes in the resistance of the pilot generator field. The third is used as a "range finder" in connection with a meter in the operator's pulpit, to keep the regulator operating in approximately the middle of its range. The combination of the three gives what practically amounts to an infinite number of points, or a continuous curve between the maximum and minimum speeds of the motor, the regulator automatically maintaining any speed at which the motor is set. In addition there is mounted in the pulpit a special voltmeter for each motor, calibrated in r.p.m., and actuated by the voltage of a tachometer generator. These meters are particularly useful when a new set up of the mill is being made, and also serve as speed indicators while the set is in operation.

That this control will hold the motor speeds constant under changing load conditions, and will not allow the speed ratio to vary enough to cause loops or to pull the strip, was demonstrated in preliminary tests at the factory before the order was placed. Experience with the apparatus in actual production has fulfilled expectations. The mill may be set up for a different product in 15 or 20 minutes and the first piece is put through at full speed.

The control is so simple and easy to operate that the regular operators experienced no difficulty in handling the equipment. In fact, the first day of operation, in spite of the numerous delays for minor adjustments such as are always necessary when breaking in new machinery, the mill produced 130 tons of strip for shipment.

How Earlier Mill Speeds Were Controlled

Previous Morgan continuous strip mills have been driven from two or more sources of power and the ratio of roll speeds fixed by gears on the roughing and intermediate stands and by belts and pulleys on the finishing stands. It is evident, therefore, that, since the gears and pulleys were almost never changed, the only possible way to change the draft in any stand was to change the size of the roll. In other words, starting with a given sized billet, the reductions made in the various stands of a continuous mill were fixed and built into the mill. These can not be the drafts best suited to all the products to be rolled on that mill.

The ideal continuous mill would have individual drive for each stand, at least on the finishing end, thus allowing the use of any desirable combination of speed and draft. This has been done for many years on cold strip mills, where the speeds are very low and the distance between stands comparatively large, so that a change in the speed ratio of any two stands does not quickly stretch the metal or form a loop too large to handle. But a high speed hot mill such as that at Trumbull, finishes at speeds around 2000 ft. per min., and the distance between stands is 8 or 9 ft.; therefore the speed ratio between stands must be maintained with an accuracy closely approximating that of gearing.

*General Electric Co., Schenectady, N. Y.

Cornell Pittsburgh Reunion

A "flying squadron" of members of the Cornell University Association of Western Pennsylvania will visit Cleveland, Cincinnati, Detroit, Buffalo, Baltimore and Philadelphia to invite Cornell graduates personally to go to Pittsburgh for the approaching Cornell reunion, Oct. 13 and 14. A. W. Wyckoff, president Wyckoff Drawn Steel Co.; William Metcalf, formerly president Braeburn Steel Co.; William K. Frank, Damascus Bronze Co.; C. M. Yohe, Pittsburgh & Lake Erie Railroad; Thomas Fleming, Oil Well Supply Co. and Karl W. Gass, Fort Pitt Engineering Co., the committee, each will spend a day in one of the cities named. Graduates more distant are being invited by mail.

Sheet Shipments Delayed

YOUNGSTOWN, Oct. 3.—A sheet maker reports it has between two and three weeks' output in its warehouses awaiting shipment, and predicts temporary operating suspension until rail situation clears.

Eight sheet mills of the Trumbull Steel Co., suspended for three weeks because of breakdown in motor drive, have resumed.

Iron the Main-Stay of Present Day Life

Fundamentals in the Metallurgy of Steel Stated in Terms of Familiar Speech—What Electrical Development Owes to Iron—Steel the Modern Supplanter

BY J. S. UNGER*

EVERYTHING this world of ours contains is made up of one or more of the 80 odd elements discovered by scientists up to the present time. I shall confine my remarks to but one element, iron, which in my opinion is the most important metal of all.

Many persons do not understand that the term "iron" is a general word describing the three common forms of iron, but believe that steel is something entirely different from iron. There is a slight difference in the three forms, but all are made from the element iron, varying from 92 per cent to more than 99 per cent of pure iron. When we speak of a hat we may refer to a straw hat, a stiff derby or a soft brown hat, but all are hats. In the same way, when we refer to iron, we may mean wrought iron, steel, or cast iron.

When Thales, the Grecian philosopher, about the beginning of the Christian era, found that after rubbing a piece of amber with a silk cloth it would attract small pieces of paper or cotton, he gave this effect the name electricity, from the Greek word electron, or amber. Doctor Gilbert, during the reign of Queen Elizabeth, produced the same effect by rubbing glass, wax, shellac and other substances. If you will rub your fountain pen on your coat sleeve you can duplicate these experiments.

About the middle of the 18th Century, Galvani, an Italian anatomist, found that by touching different parts of the body of a dead frog with separate pieces of wire and bringing the ends together, the legs of the frog twitched violently. During the 18th century, our own Benjamin Franklin, without knowing that he was risking his life, showed that electricity was present in the storm cloud. From such humble beginnings to the modern 50,000 hp. electric generator, is a giant stride. Further, this amazing development has taken place within the last 60 years. The middle aged members of my audience can recall when the only commercial use made of electricity was the telegraph. Then came the early telephones, and the arc lighting of large buildings and streets, and later incandescent lighting. As the electric motor was perfected, it was followed by the electric street car, this being an electric development within the history of almost everyone present.

Electricity Made Effective by Iron

I want to say that if it were not for iron, a strong, cheap metal, from which you construct your electric machines, and from one single property possessed only to a very slight extent by a few other metals, and by iron almost alone, electric machinery, as we know it today, would not exist. This particular property is that of being magnetized. This very banquet hall could not be as efficiently lighted, the elevators would probably be slower moving mechanical devices, the ventilating fans cumbersome, the street cars on which you came, horse or steam drawn, while your automobiles would be few in number, probably propelled by steam. Why this very association and your exhibition, together with all kindred associations, would not be in existence. You owe it all to the fact that iron and practically iron alone can be magnetized. I am bringing this out as strongly as I can to show the electrical engineer that his very art depends on the production and magnetism of iron. I am aware that certain alloys composed of metals which alone are not magnetic, such as copper, aluminum and manganese can be magnetized, but not as strongly as iron. The cost of such alloys, their brittleness and difficulty of fabrication would almost prohibit their use.

Beginnings

Little is known about the early history of iron. It is probable that gold and silver, being found by the ancients in the metallic state, were first discovered. After primitive man discovered how to make and use fire, the four common metals, copper, lead, iron and tin, were discovered.

Some historical writers are unwilling to admit iron was made by primitive man. One writer calls attention to the many legends of the ancients, claiming iron came from heaven and attempts to show that meteorites falling from the sky with a rush of fire and a loud noise would so impress primitive man as to cause him to believe it was an act of some god they worshipped who lived in the sky.

He further tries to show that the peculiar markings, figures, or striations on the famed Damascus sword blades were simply the Widmanstätten figures observed in all meteorites, caused by the difference in appearance of the two metals, nickel and iron, of which they are composed. I might add that the estimated weight of all known meteorites has been computed to be about 400,000 lb.; the largest one, of over 100,000 lb., lies in the Sierra Madre mountains in Mexico. Most of these meteorites are lying where they fell and could not account for the ancient iron articles found. Iron has been found in the pyramid of Cheops in Egypt, whose age is estimated at over 5,000 years.

According to this authority, iron used before 1200 B. C. was obtained from these sources, meteorites, by chance production of a camp fire, a flash of lightning, or a forest fire. However, we have at Delhi in India a wrought iron column which, from the inscription cut into the metal, archaeologists have determined dates from 900 B. C.

As an example of early iron it is remarkable, being a piece which is considered quite large even at the present day. This column, which is almost 3000 years old, is 24 ft. long, 21 ft. above the foundation, 16 in. in diameter and weighs over 13,000 lb. This column is in a fair state of preservation, showing that the iron workers of India possessed great skill in making iron in large masses and forging it into shape. Such a feat is envied by many of the modern iron manufacturers.

Common Forms of Iron

The metal iron exists in the arts in three common varieties, cast iron, wrought iron and steel. Absolutely chemically pure iron is unknown, as it is practically impossible to produce such material. Iron is usually found combined with many other elements, the principal and the one affecting its properties most strongly being carbon. When iron contains very little carbon, it is soft and ductile and can be easily bent and welded and is called wrought iron. Iron containing one ounce carbon to 100 lb. of iron is a soft, ductile material, almost like wrought iron, while that containing from 1 to 1¼ lb. is hard steel, such as can be tempered and made into springs, files or knives. When the carbon is raised to from 2½ to 4 lb. for every 100 lb. of iron, the metal can not be forged, but must be cast in a mold from a molten condition to obtain the desired shape. This va-

*Dr. Unger, the well known head of the research bureau of the Carnegie Steel Co., gave this address at the convention dinner of the Association of Iron and Steel Electrical Engineers at Cleveland, on Sept. 14. The address is reproduced in full, in view of Dr. Unger's success in putting succinctly, and at the same time investing with new interest and significance, familiar facts in iron and steel manufacture and use.

riety is called cast iron, which is the raw material used in the iron foundries.

Special Properties of Alloy Steels

In addition to the ordinary elements found in steel, other elements are purposely added to give certain qualities.

If but ¼ lb. of copper is added to 100 lb. of molten steel, the finished steel product will not rust nearly so fast as steel without copper.

When 12 lb. of manganese are added to 88 lb. of steel the resulting alloy is very hard and resistant to wear, and in addition very tough. Such steel is called manganese steel and is used in all frogs, switches and crossings of street car tracks, in many of the safes or vaults used in banks, and for many other purposes for which a hard, tough material is desirable.

When nickel up to 5 per cent is added to steel it increases the strength without seriously affecting the toughness. Such nickel steel is used where great strength and a reasonable toughness are necessary, as in guns, armor and large shafts. If the nickel be increased to 36 per cent an alloy called invar is obtained, which has the least expansion and contraction for each degree of heat at normal atmospheric temperatures of any metal known. Such material is used in making clock pendulums, measures, tape lines and other scientific instruments in which the least possible change in length as the temperature changes is essential.

Platinite, a nickel steel with 46 per cent of nickel, has the same expansion as platinum and has taken the place of platinum in the sealing-in wires of electric light bulbs with a great reduction in cost.

When 3 to 4 per cent of silicon, an element only one-fourth as heavy as iron, is added to steel it produces a very valuable alloy used in the manufacture of steels having certain magnetic and electric properties, and is employed in electric generators, motors and transformers, resulting in a very marked decrease in their weight. This steel is of particular interest to the electrical engineer.

Our magazines and newspapers contain articles relating to rust-resisting steels, sold under the trade names of stainless, flameless and resisto steels. Such steels are made by adding a high percentage, about 14 per cent of chromium, or chromium and nickel, to steel, which prevents rusting. Kitchen utensils, cutlery and other implements of such steels are coming into common use.

Physical Properties of Iron

An average piece of cast iron 1 in. square will break when a load of 20,000 lb. is applied. A similar piece of wrought iron has about twice this strength, or 40,000 lb. One square inch of soft steel will break at 50,000 lb. By adding carbon and other elements and heating and quenching the steel, its strength can be raised to over 300,000 lb., or a 1-in. square piece of such steel is as strong as a bar of soft steel 6-in. wide by 1-in. thick.

Steel is furnished in sizes from large masses weighing over 100 tons, such as the modern 16-in. gun or large armor plate, down to the smallest needle, or the small screw used in a watch, hardly visible to the eye.

New Uses for Steel

Steel is rapidly replacing wood, stone and bricks for many purposes. Your sky-scrapers, large bridges, large ocean steamships, and modern war materials are made possible by the use of steel. Without steel they could not exist.

Wood is becoming scarcer and more expensive, and the principal substitute is steel. Before many years the wooden railroad tie will disappear and be replaced by the steel tie. At this time this is true in some European countries. Steel furniture, steel packing boxes, steel telephone and telegraph poles and many other articles will replace wood.

Very few railroad cars are now made of wood. Your street cars and automobiles are made of steel. These new uses for steel, together with the increase in size and weight of many articles now made of iron or steel, and the increased use of steel in such countries as India or China, which use very little steel in proportion to their populations, makes the question of the future supply a serious problem.

In passing, it may be well to refer to the amount of steel consumed annually in the ordinary crown cap used to close bottles containing mineral waters, ginger ale or soft drinks of various kinds. The annual consumption is more than 500,000 boxes of tin plate or over 25,000 tons.

It may surprise you to learn that the women of the United States carry around every year about 4500 tons of wire in their hats and 7000 tons of steel in their corset stays. When this is translated into figures that all may comprehend, it means this tonnage of steel would fill 7 freight trains of 33 cars each, each car containing 50 tons of steel. The amount of steel consumed in small tacks, shoe nails and carpet tacks is about 30,000 tons annually or sufficient to fill a string of freight cars 7 miles long.

One-third of the world's population, or 500 million people, consume annually over 75 million tons of steel, or at the rate of one ton for every 7 people. When the entire world's population of 1½ billions consume steel at the same rate, which must be the result as civilization advances, the world must produce 2/3 million tons of steel every day. This enormous consumption will soon exhaust the rich iron ore beds of Central Europe, Norway, Russia, China, India, the United States, and Cuba and Chili. Beds of iron ore now considered entirely too poor to be worked will be worked before the middle of this century. The progress of civilization, in fact the future of the world, will largely depend on the ability of posterity to find an adequate supply of iron ore and of fuel, from which iron, the most important metal in the world, can be made.

Outing of New England Iron and Hardware Association

The New England Iron and Hardware Association held its annual fall outing at the Tedesco Country Club, Swampscott, Mass., Tuesday afternoon, Sept. 19. Considerably more than 100 members attended and the outing was one of the most successful ever experienced. The afternoon was given over to a golf tournament, the number participating being large. Play continued until late in the evening, following which dinner was served.

Myron B. Damon, Fitchburg Hardware Co., Fitchburg, Mass., president, presided. He introduced Austin H. Decatur, Decatur & Hopkins Co., Boston, president of the national body of hardware jobbers, who spoke briefly on the good fellowship evident at the gathering. Mr. Damon then called upon Harry L. Doten, chairman of the golf committee, to award the prizes. A. Perley Chase, Chase, Parker & Co., Boston, having the best gross score, won the distinction of having his name engraved on the president's cup, which must be won three times before it becomes the personal property of a contestant. Mr. Chase also was awarded a large silver platter. Paul Avery, Avery & Saul, Boston, with the best net score, was awarded the Loomis Cup for 1922.

Program of Farm Equipment Manufacturers' Convention

The program of the twenty-ninth annual convention of the National Association of Farm Equipment Manufacturers, which will be held at the Congress hotel, Chicago, Oct. 18 to 20, has been announced. Among the speakers will be C. H. Markham, president Illinois Central R. R., Chicago; F. R. Todd, vice-president Deere & Co., Moline, Ill., who will talk on "The Present and Future of the Implement Industry"; T. F. Wharton, secretary and controller, Deere & Co., Moline, who will speak on "Depreciation"; W. H. Stackhouse, general manager French & Hecht, Davenport, Iowa, whose address will be on "Industrial Freedom."

The McMyler Interstate Co., Bedford, Ohio, has become engaged in locomotive repair work on a limited scale and will install some additional equipment to handle this work.

Forming Gear Teeth by Hot Rolling

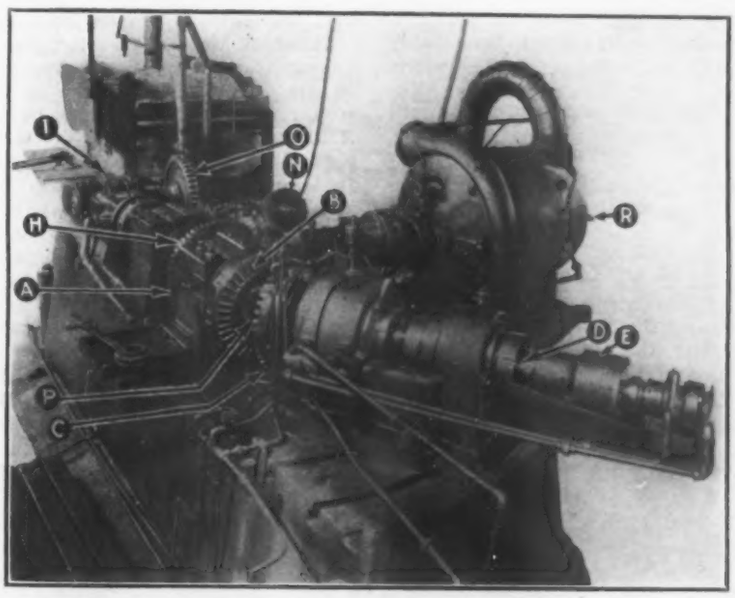
Improved Machine Finishes Teeth Complete in One Operation—Accuracy and Increased Output Features—Construction Outlined

IN THE IRON AGE of Nov. 3, 1910, the first gear rolling machine built by H. N. Anderson was described, and in the issue of April 10, 1913, important changes and improvements were announced. It is said to have been Mr. Anderson's original intention to use the tooth-rolling operation simply as a substitute for the gashing operation in gear cutting, the teeth being finished by a light generating cut or by grinding. The results obtained by the pioneer machine were said to indicate, however, that a gear rolling machine could be constructed to produce in one short operation gearing of extreme tooth accuracy.

A line of three gear rolling machines for the production of a wide range of spur and bevel gears and designed to finish the teeth completely in one operation, leaving only the cleaning up of the diameters, back faces, etc., by the usual automatic machine operations, is now being offered by the Anderson Rolled Gear Co., Cleveland.

In this process the teeth are formed by the molding-generating action of a hardened and accurately ground master-gear die that leaves the tooth surface highly polished and free from scale.

It is claimed that the hot-rolled teeth are superior in strength, finish, accuracy of form and wearing qualities. Economy and rapid production are naturally emphasized. The rolled gear blanks can be proportioned to effect 20 to 40 per cent saving in material, and are considered simple to forge. The operation requires one man as a machine operator, and one as a heater, intelligent laborers being qualified to do the work.



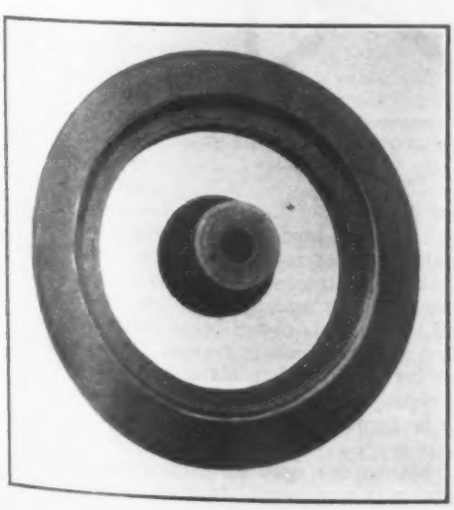
Anderson Machine for Making Bevel Gears by Rolling Teeth in a Blank Held at *C*

The output of one machine is found to be 60 to 90 gears an hour, which is calculated to be a saving in time of 90 to 95 per cent and a saving in labor cost of 25 to 80 per cent as compared to cutting methods of making.

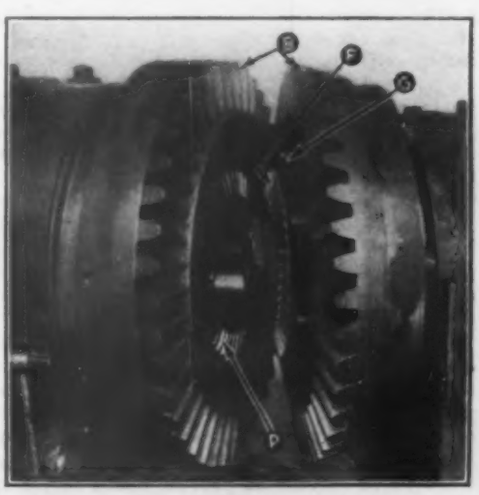
The accompanying illustrations show the bevel gear machines. Both the die shaft and the blank shaft are positively driven through timing gears separate from the blank and die, and held continually in full mesh. The timing gears constrain the forming gear or die and the plastic blank to roll on one another in positive synchronized contact without transmitting driving power and thus eliminating the slippage and tooth distortion of early designs.

The component elements of the machine include two quills, one of which receives power from the motor through a pair of bevel gears, shown at *A*, and transmits it, through the heavy timing gears at *B*, to the other quill. Means are provided for adjusting the timing gears in mesh, so that there is no back lash between them. In the bevel gear machines one quill may be swung around the pitch cone center, *C*, for various gear settings, the angular adjustment overlapping to provide the full range from 0 to 90 deg.

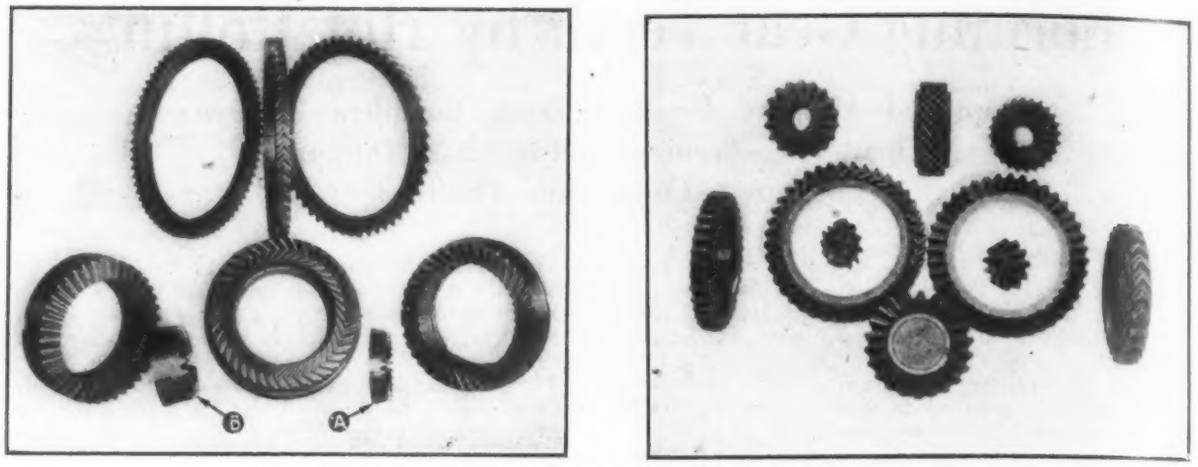
A "blank shaft," seen at *D*, is slidably mounted in one quill, and keyed to it. A pneumatic or hydraulic cylinder, *E*, mounted on the end of this shaft, actuates a piston, which extends through the shaft to clamp the gear blank, *F*, in the blank holder, *G*, on the other end of the shaft. The "blank shaft" may be adjusted endwise in its quill to accommodate blanks and blank hold-



The Gear Blank *F* Is Clamped in the Holder *G*. At *P* is the die to be duplicated, and *BB*, the timing gears, are kept in mesh without back lash



At the Left Are Shown Blanks for a Bevel Gear and for a Bevel Pinion

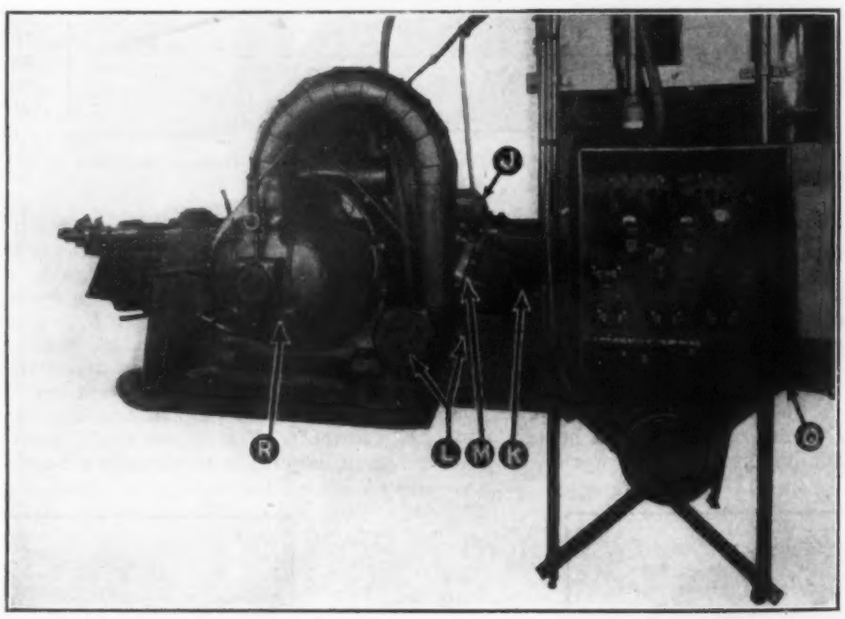


Hot Rolled Gears of Various Types and the Dies Used in Rolling Them

ers, which may be of various thicknesses, as required.

At *H* is shown the die shaft, which is slidably mounted in the other quill, and keyed to it. This shaft may also be adjusted endwise for dies of various thicknesses. To advance the die shaft gradually in its quill and with a smooth, positive motion, a cam and roller, shown at *I*, are provided.

The drive for the cam seen at *O* is taken from an oscillating shaft at *N*, and passed through a ratchet mechanism seen at *M* in the rear view, that changes it to one-way motion. The advance of the cam is proportional to the movement of the main shafts, so that when they slow down and stop during reversals, the cam does likewise. The action of the cam is to advance the die rapidly to contact with the blank; to advance it gradually and to hold it at full depth while the tooth is taking permanent form and is cooling below its critical temperature; to step the die back slightly for one revolution; and to withdraw it quickly. The withdrawal is by a spring or by a return cam. The total cam cycle for rolling one gear is about 20 sec. End thrust on both shafts is taken on roller thrust bearings.



Oscillation of the Two Main Shafts by Repeated Reversals of Rotation Is Done Electrically with a Mechanism Shown in This Rear View of the Machine

To build up the structure and profile symmetrically on both sides of the teeth, oscillating the two main shafts by repeated reversals in the direction of rotation was found necessary. This motion was previously effected by mechanical means but in the new machine is accomplished electrically by special motor equipment designed by the General Electric Co., and an adaptation of its planer-drive device. The total time of rolling a gear has been decreased by this equipment.

At *J* in the rear-view illustration may be seen the control board with three push-button boxes which provide the necessary flexible control. From one box the machine can be controlled to drive continuously forward or reverse and may be stopped at will, another box controlling the jogging of the machine slowly either forward or in reverse to provide small movements of the shafts during die set-ups, etc. The third box controls the automatic operation with its oscillating motion.

Pushing the start button causes the motor to turn automatically a pre-determined number of revolutions in one direction, stop, turn in the opposite direction, stop, reverse, and so on until the stop button is pushed. A limit switch, seen at *K*, driven by a one-way moving part of the machine, controls these automatic reversals. Its segments are arranged so that the die makes one and a fraction revolutions on the blank in each direction, but one of these overlaps is longer than the other so that the point of reversal on the blank moves around the blank as it is rolled. This distributes uniformly the slight cooling effect of the reversals around the blank.

The starting of the motor, bringing it up to speed, and stopping it, is accomplished in ½ to 1 sec. The motor rating is 12½ hp. at 150 r.p.m. The corresponding shaft speeds are 100 to 150 r.p.m. The operating panel with the solenoid contactors which effect the various operations, shown at *Q*, and the motor, seen at *R*, are entirely inclosed and equipped with forced ventilation and lubrication as shown at *L*.

The blank holder is cooled with water during the brief space between rollings, and while rolling a baffle plate is interposed between the die and the blank, and water is directed on the face of the die, which serves to cool it. The water also acts to wash scale from the die, and the film retained on the die teeth as they enter the blank tends to loosen the scale on the blank, while the speed of rotation, aided by a fine blast of air from behind the intersection of the die and blank, serves to throw off the scale. The rolling is timed to continue until the blank is cooled below its critical temperature, when no more scale is formed. The temperature contrast between the hot blank and the cool die acts as a lubricant between them, and causes the rolled gear teeth to be formed with a tough and polished surface.

The gear blanks are used as they come from the drop hammers, with commercial forging tolerances. It is said to be unnecessary to maintain sharp edges, and

the hammer dies can be used for longer runs. The blanks are designed with a thickness about equal to that at the pitch line of the finished gear, as the metal is displaced both ways. This is said to effect a 20 to 40 per cent saving in material over a cut-gear blank. The edges are beveled so that the advancing die will cut through the metal and cause it to be extended endwise along the die teeth, the blank-holder allowing a certain space for free egress of the metal beyond the ends of the teeth. The blank is heated to about 2000 or 2100 deg. Fahr. and is clamped in the holder, which is designed to restrict the expansion of the blank while it is being rolled, and permits of its quick removal.

Dies Have Plane-Surface Tooth Profiles

The die shown at *P* in the detail view is in the form of a master gear with plane-surface tooth profiles similar to those of the involute rack teeth. The teeth of this form can be machined, hardened, and ground true to profile, with the utmost precision, permitting accurate redressing at minimum expense. The speeds of the die and blank are synchronized at the rotary speeds of their engaging pitch surfaces, through the heavy timing gears. There is no driving action between them, and as the die teeth are constrained to enter the blank on radial lines and in the same relative position at each successive revolution, there can be no distortion of the teeth formed. The temperature of the die is not appreciably raised during the rolling of a gear and the proportions of the die teeth are based on the expanded dimensions of the rolled gear at its critical temperature.

Bevel gear dies are made with the nearest whole number of teeth less than the crown gear. Theoretically this tooth should have a slightly curved profile, but it is ground to the plane surface. Thus the die tooth is correct at and near the pitch line, but is slightly too thick at the top and bottom. This rolls a tooth with the slight clearance above and below the pitch line. A true octoid crown die is shown at *A* in the illustration of the dies, the relieved die shown at *B*, however, rolling a better gear. The die is redressed by grinding 0.010 in. off the tops of the teeth and bottoms of the spaces, and the proper amount off the sides to restore the correct tooth proportions. One bevel-gear die may be dressed down 1½ in. and as 300 to 500 gears may be rolled with one dressing, one die will roll 30,000 to 60,000 gears or more.

Spur-gear dies are in the form of a circular rack 2 ft. in diameter. As the pitch of the average quantity-production spur gear is rather small, when it is divided into so large a circumference the resulting tooth profile so nearly approximates a plane surface that the difference is just sufficient to provide the requisite clearance above and below the pitch line of the rolled gear. Dressing these dies reduced their diameter, but this is compensated for by reducing the thickness of the teeth and spaces in proportion to the reduction in diameter. This die may be reduced more than ¼ in. in diameter without affecting the interchangeability of the gears produced, and because of the large number of teeth in the die the intervals between dressings is several times that of the bevel die.

During the rolling of a gear the hot metal of the blank is gradually worked by the advancing die under five to 20 tons pressure, which is said to cause an advantageous rearrangement of the structure of the metal. A dense fibrous structure is forged into a trussed formation about the periphery of the blank, serving to tie the teeth to the body of the gear to help equalize warpage in subsequent heat-treatment, and to give a tough, hard wearing surface to the working faces of the teeth. Laboratory tests and results obtained under operating conditions are said to have shown that a rolled gear tooth is some 25 per cent stronger and 20 per cent harder than a similarly proportioned cut tooth of the same metal.

The strength of rolled gears may be still further increased by retaining the shroud, which is normally formed at the ends of the teeth, tying them together, it is said, in a manner which can not be duplicated by gear cutting. In a gear combination both gears may be half shrouded; the ordinarily weaker member may be finished with a full shroud, removing the shroud from the other gear; or the shrouding on both gears may be proportioned so as to develop the maximum strength of the combination. The strength of gear combinations could, it is said, be increased in many cases 50 to 100 per cent by this means.

The simple straight line profile for die teeth is suitable for both axial and oblique arrangement, so that spur and bevel gears may be rolled with straight or spiral type teeth with equal ease. The spiral type dies are as simply redressed as the straight tooth type, and they roll with much less strain and wear. It is claimed that the rolling process not only makes these gears of a uniformity and strength formerly unattainable, but it reduces their cost by 40 per cent.

The spiral-type dies are also made in two parts of opposite hands, and are joined together to form herringbone dies in either spur or bevel form. These herringbone dies roll an integral gear which it is said promises to supplant the spiral-type gear for many purposes.

Would Increase Rates in Rails

WASHINGTON, Oct. 3.—Request is made in a brief filed with the Interstate Commerce Commission yesterday on behalf of the Baltimore & Ohio, Pennsylvania and Bessemer & Lake Erie Railroads that the commission vacate its suspension order prohibiting the carriers, pending investigation, from putting into effect sixth class rates on new iron and steel rails and cross ties from certain producing points in the United States to Canadian destination. It is proposed by these tariffs, which affect rates that have been the object of a long controversy between rail makers and American and Canadian railroads, to substitute sixth class for commodity rates, which would have the effect of increasing rates about thirteen per cent from some rail making points in the United States. The sixth class rates already apply from Youngstown, and Lorain, Ohio. The protestants are the Cambria Steel Co., Carnegie Steel Co., Lorain Steel Co., United States Steel Products Co., and the National Tube Co. The new rates proposed were filed to apply from points in Maryland, West Virginia and Pennsylvania, those specifically under attack applying from Sparrows Point, Md., and Bessemer, Johnstown and Steelton, Pa. An indication of the present rates is that of $3.40 per gross ton from Bessemer and Johnstown to Montreal.

Railmakers have protested against the proposed sixth class rates and have contended they could not meet competition of Canadian manufacturers and producers in England if the rates are increased.

Farrell Plant Resumes

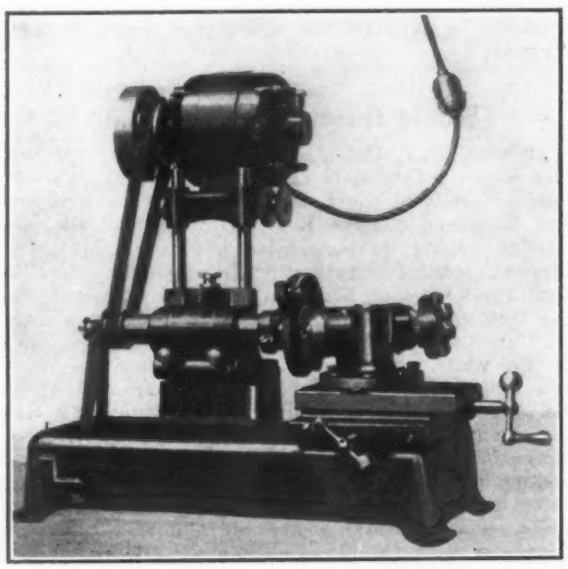
Operations were resumed this week at the Farrell, Pa., plant of the Carnegie Steel Co., idle seven weeks on account of coal and coke shortage. Resumption as scheduled of the three blast furnaces at this property will increase the number of active stacks in the Mahoning and Shenango Valleys to twenty-eight, of forty-seven, the highest operating number in the district this year. It will give the Carnegie company twelve active furnaces, of fifteen in the district.

As iron output gets under way, the company's fourteen open-hearth furnaces at Farrell will be charged. Enlarged production of semi-finished steel will enable the Mercer works of the American Sheet & Tin Plate Co. to operate on a broader basis.

Charles A. Moffett, president Gulf States Steel Co., Birmingham, Ala., who has spent a month on the Pacific Coast and in the Rocky Mountains, says connections on the West Coast for the marketing of Alabama iron and steel products are on a firm and permanent base. The large and regular movement of cast iron pipe, pig iron and steel products via ships out of Mobile at low transportation charges has served to build up a large and stable business, which he now regards as of a permanent nature.

Sapihl Portable Electric Grinding Machines

The General Tool & Equipment Co., Chicago, has put on the market a portable electric internal and external grinder for attachment to engine lathe, milling machine, shaper, etc., and a portable electric valve grinder which consists of a tool post grinder mounted on a base for valve grinding. The machines are manufactured by the Sapihl Electric Tool Co., Galesburg, Ill. An outstanding feature of the Sapihl tool post grinder is that the motor is held above the spindle on two supports and power is conveyed by belt from motor to spindle. This arrangement was made to prevent motor vibration from being carried to the work. The motor is furthermore specially built for speed and endurance. The grinder is made in two types, the No. 1 type having a ⅛-hp. ball bearing motor and the No. 2 type a ¼-hp. motor. Two sets of double row S.K.F.



The Portable Electric Valve Grinder Consists of a Tool Post Grinder Mounted on a Base for Valve Grinding

self-alining ball bearings are located in the spindle, one set next to the pulley and the other at the wheel-holding end.

The motor is held in position by a lock screw which is pressed against one of the two supports. The motor is lowered or raised by a knob operating a rack and pinion, one of the two motor supports serving as a rack.

The base is a solid steel casting of L-shape construction with a 1⅞-in. hole to fit over the tool post of a lathe. It is milled and ground for dovetail wheel slide base. Attached to the base also is a micrometer screw with collet graduated to one-thousandth of an inch and capable of moving the wheel slide base vertically to a delicate adjustment.

Both types of grinders are supplied with an extension for internal grinding. On the No. 1 type the emery wheel for external grinding is ⅜ x 4 in., while a ¾-in. diameter wheel is used for internal grinding. The speed of the spindle for external grinding is 6500 r.p.m. and for internal grinding 22,000 r.p.m. The No. 2 type carries a ½ x 6-in. wheel for external and a 2-in. wheel for internal grinding. The spindle speed for external work on this type is 4000 r.p.m. and for internal grinding 12,000 r.p.m.

Only the No. 1 type is mounted on the valve grinding attachment. It is detachable and is fastened to the attachment by a cast-iron washer and a ⅝-in. cap screw. A carriage on the attachment having both longitudinal and cross feeds carries a revolving head on which the work is mounted. On the end of the head is a nut for a draw-in collet. The head is equipped with two sets of ball bearings and rotates at 175 r.p.m. in a direction opposite to that of the grinding wheel. At the base of the head is a dial graduated up to 90 deg., so that the work can be accurately set at any angle within that range. A lock clutch on the attachment permits the operator to throw the head in or out while the motor is running.

The Sapihl grinder with valve-grinding attachment is sold largely to garages and service stations for valve grinding. Ordinarily valves are ground with the head of the attachment set at 45 deg. The standard No. 1 and No. 2 external and internal grinders are used for making tools, dies, special bushings, milling cutters, and in industrial machine shops for a large variety of work which does not justify the use of special purpose grinding equipment. It may also be used as a bench grinder as it can be readily moved from one place to another, being self-balanced and capable of standing without being fastened to another machine.

Motion Study Data Exhibited

An exhibition of management and motion study data including photographs and process charts, route models and motion study apparatus was given Sept. 21 to Oct. 1, at the Newark Museum, Newark, N. J., by Frank B. Gilbreth, Inc., consulting engineer, Montclair, N. J. The exhibition was well attended by executives, engineers and others interested in the problems of management, and representatives of the company were present to explain the various photographs and models. A large part of the photographs were 48 in. by 52 in., and many were enlargements from motion picture films.

An interesting exhibit was the picture of a girl in the act of making cores, selected as being the best operator. The picture was entitled "Capturing Skill," and revealed the motion which was responsible for high efficiency. Having thus found the one best method the motion was taught the other operators, and in this way the breaking of cores was greatly reduced.

A picture of a route model to scale of a factory, showing the present and proposed position of machinery, which was indicated by colored pieces of paper, was exhibited, the routes of the material being mapped out by colored strings. In the line of fatigue elimination a special one-purpose work bench, designed after a study of the operation in the laboratory, and said to have reduced the number and lengths of motion necessary to perform the job, eliminating greatly the fatigue formerly experienced by the worker, was shown. A Barney foot-rest barrel in use was shown in an enlarged photograph.

Molybdenum as an Alloying Element

The work on molybdenum as an alloying element in steel, conducted at the Ithaca, N. Y., field office of the U. S. Bureau of Mines, in co-operation with the Vanadium Corporation of America, will be continued in the present fiscal year as a Bureau of Mines problem. The object of this work is to add to the technical information on the value of molybdenum, one of the few elements entering into true alloy steels of which the United States possesses an abundance of high-grade ore, readily mined and handled. Besides the more common physical tests, single-blow impact and repeated impact tests have been made by the Bureau of Mines on the molybdenum and on comparison alloy steels in co-operation with the Wyman-Gordon Co.

Chief attention has been given endurance tests. This work has been expedited by conclusions drawn from the recently reported work on endurance testing at the University of Illinois and at the Naval Experiment Station. As the alloy steels are of much value when heat-treated to give high tensile strength and hardness, and as the investigators above mentioned have worked mainly with plain carbon steels or with alloy steels not heat-treated to great hardness, especial attention was paid to molybdenum and other alloy steels so treated as to give great strength. The making of the steels and the heat treatment and preparation of test bars have been completed. Actual endurance testing remains to be done before complete conclusions can be drawn.

Further study is also to be made on the relationship of the "rise of temperature" method of endurance testing, and the regular method of actually testing the steels to destruction by long-time tests.

British Meeting on Non-Ferrous Metals

Corrosion, Brasses and Bronzes for Superheated Steam Work and White Metal Bearing Metals Discussed at Meeting of Institute of Metals

SWANSEA, Wales, Sept. 21.—Swansea—where the Institute of Metals held its autumn meeting from Sept. 19 to Sept. 22—is one of the oldest and most important metallurgical centers in Great Britain, chiefly through its copper smelting industry. Copper smelting was first carried out at Neath 300 years ago, and in 1717 it was commenced at Swansea by Dr. Lane. Later the industry passed into the hands of the Vivian family, under whose control it still largely remains. Sheet steel, galvanized iron and tin plate manufacture are now extensively carried on in the neighborhood of Swansea, which is generally regarded as a link between the ferrous and non-ferrous metal industries, for practically the greater part of the non-ferrous metals in which the institute is closely interested are manufactured there.

Leonard Sumner, the president of the Institute of Metals, presided over the meetings, and the announcement made on the opening day that he had been nominated for re-election for another year was well received. F. W. Gilbertson, president of the South Wales Siemens' Steel Association, was unable to be present during the earlier part of the week, but the arrangements which he and a local committee had made for the reception of the visitors contributed largely to the success of the social side of the gathering.

The first annual lecture on subjects of practical interest to those engaged in the non-ferrous metals industry was delivered by Dr. R. S. Hutton, who chose as his subject "The Science of Human Effort." He described health, strength, comfort, environment and training as essential conditions for the satisfactory exercise of human effort. During his illustrations he stated that the percentage of deaths due to phthisis among grinders and in the general population of Sheffield was in the five years, 1908 to 1912, as follows: grinders 51.2 and general population 7.7 per cent; in the five years 1917-1921 the figures were grinders 37.8 per cent and general population 7.6 per cent. With regard to the need for good ventilation Dr. Hutton pointed out that the percentage reduction in summer in tin-plate rolling varied from 3 per cent in works where the state of artificial ventilation was good to 13.4 per cent where there was no artificial ventilation, the natural ventilation being poor. He also referred to recent investigations concerning time and action study applied to metal polishing, pointing out that time could be saved after instruction by specially trained workers who had previous experience in the trade.

Nature of Corrosive Action

The business side of the meeting commenced on Wednesday with the reading of a report prepared by Dr. G. D. Bengough and J. M. Stuart on "The Nature of Corrosive Action and the Function of Colloids in Corrosion." His report attempts to present a general discussion of corrosive phenomena, based on the study of several different metals, and to examine how far the electro-chemical theory of corrosion (usually called the electrolytic theory) can account for the observed phenomena. Corrosion is defined in the report in its widest sense as the oxidation of a substance. Facts which are difficult to explain on a purely electro-chemical theory are the following:

1. Certain depolarizers do not increase corrosion, but actually inhibit it.
2. The conductivity of electrolytes is not directly connected with the amount of corrosion.
3. Lambert's pure iron (probably the purest metal ever produced) was found to be readily attacked by sodium chloride solution and dilute acids.
4. According to the electro-chemical theory, the presence of ions of the corroding metal should depress the corrosion of most of the common metals. There are, however, numerous exceptions, and in some cases the presence of such ions actually increases corrosion.

As regards the effect of impurities on the corrosion of metals, a trace of impurity appears to assist local corrosion, but the amount of corrosion is not proportional to the amount of impurity. Even the presence of graphite does not appreciably stimulate the rate of corrosion of iron. The effect of a trace of impurity is probably a trigger action.

On the electro-chemical theory the action of oxygen is that of a depolarizer. It can be shown, however, that atmospheric oxygen has very little depolarizing power at ordinary temperatures. The main function of oxygen in corrosion is to oxidize directly the metal, and also in some cases the products of corrosion.

Two chief types of corrosion are distinguished: (1) The general type, usually characteristic of acid corrosion; (2) the local type, usually characteristic of corrosion in water and salt solutions. The second type is generally characterized by the formation of an adherent scale on the metal, and this scale may contain colloid.

A theory is developed regarding the part played by colloids in corrosion, and this theory may be briefly outlined as follows:

A metal immersed in water sends positively charged metal ions into the liquid, and becomes itself negatively charged. In the case of ordinary commercial metals, the metal also becomes superficially oxidized if dissolved oxygen is present. The hydroxide produced by this oxidation can take up the ions given off by the metal, and the hydroxide thereby passes into the state of a positively charged colloid. Some of this colloid will diffuse away, permitting further reaction between the oxygen and the metal surface, and thereby reforming the hydroxide film over the latter. Oxidation is then stopped till this hydroxide can pass into the colloidal state by acquiring positively charged metal ions. This, in general, does not take place till the colloid initially formed has diffused into the presence of electrolyte, when it is precipitated by the union of the dissolved salt, the action neutralizing the charge on the metal corresponding to that on the colloid. This allows the metal to send more ions into solution, and the uncharged hydroxide thereby acquires a charge. If the colloid so produced can diffuse away, the process can continue and corrosion develop.

For steady corrosion, therefore, the colloid must be produced under conditions which allow it to diffuse some distance from the metal before precipitation. If it precipitates directly on the corroding surface it will, in general, adhere to the latter and stop corrosion.

Prof. H. C. H. Carpenter, who opened the discussion, mentioned that the Brass & Copper Tubes Association had increased its contributions to the research fund from £300 to £500 annually. The Department of Scientific and Industrial Research had made a large grant toward the work, and it might be said that a stage had now been reached when the value of the work was becoming more and more widely recognized. He thought that the conclusion of Dr. Bengough and his collaborators tended to show that there was no solution to the corrosion problem and that no metal was really unoxidizable, but he did not share that view.

U. R. Evans expressed satisfaction that the authors of the report laid stress on the physical character of the corrosion product in determining the persistence of corrosion. He dwelt at length on the theories of corrosion.

W. H. J. Vernon put in a plea for the simplification of corrosion nomenclature, the need for which no one familiar with corrosion literature would dispute. Either the metal passed into solution in the ionic condition in virtue of its electrolytic solution tension, or the surface of the metal was attacked by molecular oxygen already present in solution.

Effect of Superheated Steam on Non-Ferrous Metals

Superheated steam is now very generally used on locomotives, the steam usually leaving the superheater at a temperature of 340 deg. C. Piston tail rod bushes in the Midland Railway practice were originally made of: copper, 87 per cent; tin, 9 per cent; zinc, 2 per cent

and lead 2 per cent, called M. R. A. 1 alloy. This was found to break in service. The cast iron which replaced it was found to score the rods, but a phosphor bronze of the following composition has been found to be satisfactory: copper, 88 per cent; tin, 11 per cent and phosphorus, 1 per cent.

McNamee piston rings of the following composition: copper, 75.5 per cent; tin, 8.5 per cent; zinc, 0.33 per cent; phosphorus, trace; nickel, 0.5 per cent and lead, 15 per cent, are used satisfactorily. These rings are to prevent the steam coming into contact with the white metal packing rings, of the following composition: lead, 70 per cent; antimony, 30 per cent. Recently when the temperature of the steam leaving the superheater has been as high as 425 deg. C, trouble has been experienced with the packing rings fusing. The full heat is only on these parts intermittently.

White Metals

A. H. Mundey, C. C. Bissett and J. Cartland reviewed the principal classes of white metals, their composition and physical properties, chiefly in relation to their uses and manufacture. They find that the chief value of white bearing metals is due to the way in which they maintain the oil film. This is effected by the hard constituents standing up in use in slight relief, the softer matrix thus forming numerous evenly distributed channels, which maintain the oil by capillarity. A single metal, or a metal consisting of a solid solution, will not function as a bearing metal.

The greatest care and skill must be exercised in the handling of bearing metals in practice, otherwise either the hardening constituents will be left in the ladle by liquidation or the metal will be overheated and the structure spoiled.

Sir Henry Fowler, who opened the discussion, said he was under the impression that for aeroplane work—aero-engines—the alloy was not one having tin 93 per cent, antimony 3.5 per cent and copper 3.5 per cent, but one having 86 per cent of tin, 10.5 per cent of antimony, and 3.5 per cent of copper. In locomotive work, where it was important to have a bearing metal which stood up to alternating pressures, the proportions were 85 per cent, 10 per cent and 5 per cent, this was universally used for locomotives and other engines where there occurred repeated alternating pressures. The authors' alloy having tin 20 per cent, antimony 15 per cent, copper 1.5 per cent, lead 63.5 per cent was also used, but the Brinell hardness was lower than the figure given by the authors. If there were no change in the stress this was a very satisfactory metal.

Dr. Walter Rosenhain doubted the "oil channel" formed in the body of bearings. There was, he held, no appreciable difference of level between the hard and the soft surfaces. The crystals were supported in a plastic matrix, and very probably a film of softer substance flowed over the harder and acted as a lubricant, forming a colloid of oil and softer metal.

Mr. Mundey, in his reply, said the paper dealt with representative metals which were actually in use, and the tests upon them were accurate. The figures of physical tests quoted were given so that the engineers could visualize the conditions of the metals they were using.

BRITISH FOREIGN TRADE

August Steel Exports Increase—Imports Second Largest for the Year

The August official data on British foreign trade in steel and iron show that the total exports were 281,954 gross tons. This is an increase of 30,211 tons over July. The August exports make the average for the first eight months 269,884 tons per month. Exports of scrap are included. To Sept. 1, this year, total exports have been 2,073,635 tons against 1,025,312 tons for the same eight months in 1921.

The August imports were 84,003 tons or next to the highest this year, those in January having been 100,178 tons. The average for the first eight months of this year is now 74,881 tons per month. These data also include scrap. The following table shows comparative data:

British Steel Exports and Imports, Gross Tons

	Exports	Imports
July, 1922	251,743	55,893
August	281,954	84,003
Aver. per month, first quarter, 1922	267,047	82,536
Aver. per month, second quarter, 1922	274,830	67,785
Aver. per month, third quarter, 1922	267,271	62,392
Aver. per month, 1921	144,885	152,734
Aver. per month, 1920	274,881	128,685
Aver. per month, 1919	188,519	50,801
Aver. per month, 1913	420,757	195,264

The following table covers the principal exports:

Principal British Exports, Gross Tons

	Average per Month		August	
	1913	1921	1921	1922
Pig iron	78,771	8,602	3,336	30,643
Steel rails	41,676	14,698	4,848	22,358
Steel plates	11,162	10,673	6,174	6,273
Galvanized sheets	63,506	17,635	10,153	47,404
Steel bars	20,921	8,927	4,074	17,533
Tin plates	41,208	18,873	8,787	36,817
Black plates	5,679	1,178	388	4,722
Steel sheets	.....	.....	1,093	13,855
Total exports, first 7 months, 1922				2,159,074
Total exports, first 7 months, 1921				1,025,312

The most marked recovery in the August exports this year over those in August, 1921, has been in pig iron, rails, galvanized sheets, steel bars and tin plates.

Pig iron imports in August were 14,685 tons compared with a monthly average in 1921 of 55,564 tons.

Iron ore imports in August were 295,360 tons which compares with a monthly average in 1921 of 157,298 tons.

Manganese ore imports in August were 29,644 tons. Last year they were 14,405 tons per month and in 1913 they were over 50,000 tons per month.

Greater Use of Rivers for Steel Shipments Is Planned

Of more than casual interest to the Pittsburgh and Wheeling district's steel manufacturers was the meeting of the Ohio Valley Improvement Association in Louisville, Ky., Oct. 3 and 4. Out of this meeting it is expected will come a definite plan for the creation of a company which will construct freight and passenger terminals at various points along the Ohio River from Pittsburgh to Cairo, Ill. The chief hindrance to the more general use of the inland waterways in the delivery of iron and steel products is the lack of dockage and loading facilities at many points along the rivers which are ideally located to be distributing centers, not only in the matter of local supplies but for distant deliveries over the railroads tapping these points.

Pittsburgh and Wheeling district steel companies are alive to the importance of the rivers as arteries of trade, and already much activity is observed in the construction of wharves and loading equipment. The Carnegie Steel Co. has about completed plans for greater use of the rivers in getting materials away from its plants, most of which in Pittsburgh have access to the rivers. This company a few years ago, when railroad transportation snarls were frequent and exasperating, worked out plans for river shipments of steel, but abandoned them when the railroad situation improved. It is probable that this company will handle river shipments for other steel corporation subsidiaries, since it already has a fleet of tow boats. The Jones & Laughlin Steel Co. already has demonstrated the utility of the rivers and the Wheeling Steel Corporation is actively going ahead on betterments aimed to facilitate river deliveries.

Westinghouse Electric & Mfg. Co. has arranged for the construction of a building in Philadelphia at a cost of $850,000. It will provide about 200,000 sq. ft. of space and will house the company's offices, local service shop and warehouse.

Canada's Trade with United States Declines

Value Has Fallen Off 56 Per Cent in a Year—Outlook Is for at Least Partial Recovery—Better Economic Conditions in the Dominion

BY WILLIAM LEWIS EDMONDS

TORONTO, Sept. 19.—Canada's import trade with the United States in iron and steel and their products for the fiscal year 1922 will doubtless be remembered for the remarkable extent to which it declined in value as that of the previous year was noted for the new high record to which it attained.

The value of the trade was $99,951,737, a decrease for the year of $126,903,988, or about 56 per cent, while it is under that of two years ago by $78,709,869, or nearly 40 per cent. Not since 1916 has the trade had as low a value, although it exceeds that of the latter year by $28,491,966, or nearly 40 per cent. It is also in value more than a million dollars better than the trade of the fiscal year 1914, which ended a few months before the outbreak of the Great War, but, on the other hand, the 1922 trade is less than that of 1913 by over $20,500,000, the figures for the latter year being $120,636,597.

So general was the decrease that it extended to every general classification, but three alone were sufficient to account for a decline in the aggregate of nearly $88,000,000, or almost 70 per cent of the grand total. Of these three, the most remarkable was the decline in the imports of rolling mill products from the United States, the figures being smaller than those of the preceding year by $51,195,966, or over 72 per cent. Under the classification of "boilers, engines, pumps and windmills" there was a decline of $16,931,375, or over 67 per cent, and under that of machinery (not including agricultural machinery) a decrease of $19,789,712, or over 48 per cent.

Although total trade imports of iron and steel from the United States show such a remarkable decline, there has been only a slight reduction in the proportion relative to total imports from all countries, it being for the year under review 90.69 per cent, as compared with 92.35 the previous year, 94.81 in 1920, 93.58 in 1916, and 82.72 per cent in 1913.

Imports From United States Under Principal Classifications

The following table gives the principal imports from the United States for the fiscal years 1922 and 1921, together with the total from all countries for the former year:

	1922	1921	All Countries, 1922
Iron ore	$1,721,438	$5,038,900	$1,936,247
Agricultural implements	5,326,141	11,430,226	5,479,617
Boilers, engines, pumps and windmills	8,289,063	25,220,438	8,554,540
Castings	1,171,193	2,336,218	1,291,561
Chains	361,648	994,189	464,189
Cutlery and hardware	2,094,983	3,815,885	3,470,476
Firearms	215,948	638,511	313,886
Machinery	20,974,568	40,764,280	23,310,672
Rolling mill products	19,554,392	70,750,358	21,791,664
Scrap iron or steel	338,042	2,405,913	343,380
Smelted products	805,706	3,750,261	916,094
Springs, all kinds	177,932	557,121	181,173
Stamped and enameled ware	784,342	938,242	868,286
Tools and hand implements	1,059,952	2,315,480	1,181,696
Vehicles, chiefly of iron	21,994,154	26,393,390	22,588,897
Wire	2,202,577	5,981,823	2,889,392
Axles, parts, etc.	1,563,946	2,309,168	1,565,128
Pipe fittings	462,632	1,065,582	483,224
Forgings	122,765	360,920	128,919
Drums, barrels, tanks	465,061	1,438,627	527,718
Scales, balances, etc.	199,410	258,213	209,768
Stoves, all kinds	267,836	424,867	272,866
Tin cans and containers	636,249	777,719	643,022
Valves, n.o.p.	435,658	880,863	493,075
Manufactures chiefly of steel	7,092,294	12,555,512	7,706,497

Features in Engine Imports

The most outstanding feature under the engine classification is farm traction engines costing not more than $1,400, the imports of which from the United States had a value of but $1,340,016, as compared with $10,160,949 the previous year, while for those of higher cost the figures were $521,832 and $2,436,367 respectively. Taking the two descriptions, there was a total decline in the imports of $10,735,468, or over 84 per cent, which may be ascribed to the agricultural depression obtaining and to a more adequate and cheaper supply of farm labor. In automobile engines the imports had a value of but $3,117,839, as compared with $5,387,416 the year before and $8,402,351 two years ago. With the improvement being experienced by the automobile industry, imports of engines should show a recovery during the current fiscal year; in fact, according to official returns, it is already under way. Imports of internal combustion engines, other than those for automobiles, had a value of $899,338, as against $2,175,077 the previous year, and locomotives for steam railways $110,320 against $542,643. Imports of power pumps and parts fell during the year from $1,201,506 to $683,209.

Many Declines in Machinery

With few exceptions, all lines of machinery imported from the United States experienced a decline. Under the classification of "Other machinery, wholly or in part of iron and steel," the trade fell from $19,704,650 to $8,521,363. Textile machinery, valued at $1,853,129, showed a decline of over three millions. Rolling mill machines dropped from $646,087 to $235,134, and saw mill machines from $320,543 to $115,233. Although there was an increase in the importation of paper mill machines, the value being $1,715,416, against $1,296,543 the previous year, pulp mill machines dropped from $415,252 to $41,218. Machine drills fell in value from $744,169 to $206,758, and power lathes from $542,246 to $116,091. Besides the influence of the industrial depression experienced during the past two years, the market has been carrying a surplus of both these types of machines over from the activity of the war period.

Rolling Mill Products Affected

A conception of the extent to which the various rolling mill products imported from the United States contributed to the marked decrease noted may be gathered from the following table dealing with the principal lines for 1922 and 1921 respectively:

	1922	1921
Bars, bands, hoop, etc., above 3½c. lb.	$2,028,209	$11,587,594
Hoop, band, scroll, etc., 14 gage and thinner	569,087	2,283,411
Bar iron or steel	1,483,834	4,690,905
Hammered, drawn or cold rolled iron or steel bars or shapes	1,231,317	5,492,046
Steel rails	858,608	980,191
Boiler plate	154,114	1,040,554
Canada plates, etc.	577,644	1,153,659
Tin plate	2,727,087	8,605,139
Steel plates, all kinds	2,829,116	9,684,177
Galvanized sheets	1,289,743	2,584,206
Skelp for making pipe	1,988,388	5,963,149
Wire rods	681,914	1,630,836
Angles, beams, channels, etc.	1,877,487	8,833,877
Steel plate for bridge and car work	189,212	1,532,521
Seamless tubing, all kinds	1,127,320	3,133,382
Beams, sheets, plates, etc., for shipbuilding	63,035	2,592,165

Contributing causes to the decrease in tin plate, aside from the trade depression, are larger imports from Great Britain—the value being $1,288,213, compared with $297,317 a year ago—and supplies from the new mill located at Toronto. The almost total disappearance of imports of steel for shipbuilding is of course the almost complete cessation of work at

the yards which sprang into existence during the war period.

In smelted products the principal declines in imports from the United States were: Pig iron, from $2,287,027 to $392,238; billets, not less than 60 lb. per lineal yard, from $476,503 to $322,474; ingots, blooms, etc., from $253,245 to $56,547; ferromanganese, from $577,505 to $23,855.

Features in Vehicle Imports

While under the general classification of vehicles, imports from the United States declined by nearly $4,400,000, there was one important line in which there was a fairly substantial increase, and that was in passenger automobiles, the number being 7,092 valued at $9,062,184, compared with 5,891 and $8,339,704, respectively, the previous year. On the other hand, imports of freight automobiles fell from $3,476,163 to $1,492,290 and automobile parts from $11,729,731 to $10,189,926. There was also a marked decline in railway cars, the aggregate value for all descriptions being $925,327, as compared with $2,210,166 the year before.

Cutlery and Hardware

Except in razors, the value of which was $61,147 against $41,109, there was an all-round reduction in cutlery imports from the United States, the total being $330,006 against $696,524. Under the hardware classification, there was a decrease in every line, the most outstanding being as follows: Builders' hardware, from $703,950 to $391,560; locks, $676,418 to $320,823; butts and hinges, $164,078 to $88,341; wire nails, $197,786 to $163,215; nuts, rivets and bolts, $389,355 to $213,638. Total value of the hardware imported from the United States was $1,764,977, as compared with $3,119,361 the previous year.

Outlook for Current Year

That the outlook for the current year in respect to importations from the United States warrants the belief that at least a partial recovery will be experienced there appears to be no doubt. The fact that the exchange situation is now approximately at normal should help to some extent. But that which promises to be a much more important factor is the development of a better economic situation throughout practically all parts of the Dominion. This year's harvest is undoubtedly the most bountiful experienced for seven years. There are extensive areas in Saskatchewan and Alberta where the yield is light, but the deficiency in these isolated instances is more than compensated for by the bountiful yields in Ontario and Manitoba, the generally fair crops in Quebec and the Maritime Provinces, and the excellent results obtained in the southern parts of both Alberta and Saskatchewan. The mining industry of the Dominion, and particularly in respect to the precious metals and coal, is experiencing an expansion, and the same is to be said in regard to both the lumber and fishery industries, while the pulp and paper mills are practically running to full capacity.

To Handle Pulverized Fuel with Compressed Air

Among the details of equipment to be used in handling pulverized coal at the new Cahokia station of the Union Electric Light and Power Co., St. Louis, the method of weighing the fuel and conveying it from the pulverizers to the boilers is of interest. Fuel requirements for the first group of units is estimated at 1000 tons in 16 hr.

Below the floor level of the pulverizing room will be placed five blowing tanks, which serve five twin pulverizing units. These blowing tanks will rest on platform scales, the dial of which will indicate to the operator in the pulverizing room the amount of fuel in the tank.

Fuel will feed into these tanks by gravity from pulverized fuel bins in the pulverizing room. Each charge will be automatically weighed and then elevated by compressed air to a height of about 75 ft. through 4-in. pipes. By means of a simple system of switching valves and parallel distributing mains, cross connected, any blowing unit can discharge into any of the eight inclosed storage hoppers in the boiler house. These hoppers serve the four pairs of boilers, of 1780 hp. each, comprising the first group of boiler units to be installed.

This equipment will be installed by Quigley Fuel Systems, Inc., 26 Cortlandt Street, New York.

Reducing Hematite to Magnetite with Methane

During recent experiments on the reduction of iron ores with fuel gases carried out at the Pacific Experiment Station of the Bureau of Mines, Berkeley, Cal., it was noticed that at temperatures up to 800 deg. C. (1472 deg. Fahr.) the methane in these gases was practically inert as compared with hydrogen or carbon monoxide. A number of experiments were then carried out with mixtures of methane and hydrogen over a wide range of temperatures, to find out when the methane would begin to function actively as a reducing agent. While it reacted slowly at all temperatures tested, its reaction in the reduction of hematite to magnetite, the first stage in the reduction of iron, did not become sufficiently rapid to be of industrial importance until temperatures of over 900 deg. C. (1652 deg. Fahr.) were used. A rough approximation of the velocity constant of this reaction was made for all the temperatures at which tests were made, in order to obtain some unit figures of value in designing industrial apparatus for carrying out this reaction.

Details of these experiments are contained in serial 2382, which can be obtained from the Bureau of Mines, Washington.

Philadelphia Bridge Towers

Each of the two steel towers of the new suspension bridge now being built to connect Camden, N. J., with Philadelphia will contain 5000 tons of steel, according to details made public by the engineering department of the Joint Bridge Commission. Of the total of 10,000 tons, 6000 tons will be of alloy steel and 4000 tons of steel castings. Each tower will measure 350 ft. above the top of its pier and 380 ft. above the water, the two legs of the tower being 89 ft. apart and 39 ft. wide at the pier, tapering to 12 ft. wide at the top.

Both piers, of concrete and granite, are approaching completion, and bids for the erection of the steel towers are to be asked for in October, in hopes of getting the awards made in November. The bridge, one of the greatest in the world, will have a main span of 1750 ft., comparing with 1600 ft. in the Williamsburg bridge, 1595 ft. in the Brooklyn bridge and 1470 ft. in the Manhattan bridge, the three largest of the suspension type now in service. The Quebec bridge, of cantilever type, has a main span of 1800 ft., while the cantilever Firth of Forth bridge has two spans of 1710 ft. each. All of these spans will be eclipsed by the 1803 ft. of the suspension bridge to be built between Windsor, Ontario, and Detroit.

Employees of James Leffel & Co., Springfield, Ohio, are working each night until 8.30 o'clock. President A. F. Sparks says prospects are bright for the fall and winter. Foreign orders were received during the past week from the Argentine and Columbia, South America, and from Mexico.

Lower Temperature in Preheating Cast Iron Thermit Welds

In order to compensate for the lower melting point of cast iron as compared with steel, the Metal & Thermit Corporation, New York, recommends that in preheating cast iron sections, preparatory to welding them with thermit, these sections be heated only a little more than necessary to show color, such as a dull red heat. If this advice is followed, a quieter pour will be obtained and the fusion will be just as perfect. This practice has now been tried successfully in numerous cases, the most important case being a weld on a large cast iron press head which required 1100 lb. of thermit. The weld is reported as perfect, with good fusion to the extreme of the edge of the collar, although the cast iron section was heated only to a dull red heat.

It is believed that this point is important and that operators will find that it will overcome possible difficulties which they may be experiencing in cast iron welding. One might suppose that as the cast iron of the parts being welded is not quite so fully expanded at this lower temperature there might, therefore, be a slightly greater tendency for hair line cracks to appear in the thermit steel collar perpendicular to the line of break. This has not been found to be the case, probably because the expansion curve is much greater up to a red heat than it is from the red heat to the white heat and that the sections are, therefore, practically fully expanded at this dull red heat. It is certainly also true that the thermit steel at first heats and expands the sections with which it comes in contact and, therefore, the slight difference in pre-heating is negligible.

Scrap in the Open-Hearth Process

Commenting on the greater use of scrap in the open-hearth process, the London *Ironmonger* has the following to say:

"In the United Kingdom it was formerly believed that good basic open-hearth steel could not be made if over 50 per cent of the charge was scrap. During the war years the presence of large quantities of scrap, and also, in some countries, a shortage of pig iron greatly stimulated efforts to develop a technique by which the proportion of scrap to pig iron used in the production of steel might be increased. It has now been demonstrated that it is possible to use more than half scrap in the basic open-hearth process with satisfactory results. The price of scrap in relation to the cost of production of pig iron will be a factor in future development, but there is every evidence that the limits of the use of scrap have by no means been reached. Large proportions of scrap are usually associated with the basic process, but some years ago a casting works in the United States was using over 90 per cent selected heavy acid open-hearth bloom ends in making up their charge. The scrap iron trade is almost as extensive as the pig iron business in that country. This practice is used by manufacturers in fluctuating markets, enabling them to play off the pig iron and scrap markets one against the other."

Powers of Congress Over State Corporations

WASHINGTON, Sept. 26.—Dealing with the important question of the inquisitorial powers of Congress over State corporations, directly or through delegated agency, James A. Emery, counsel for the National Association of Manufacturers, has prepared an extremely interesting and informative opinion in response to an inquiry coming from a representative of a manufacturers' association in one of the States. While the opinion is based on a specific inquiry as to the right of the Federal Trade Commission to get certain information regarding factory, wholesale, and retail price conditions of the house furnishing goods industry and trade, beginning with January, 1920, as requested in a Senate resolution, the principles of the subject are so far reaching as to include all industries. It touches points that are particularly vital to the iron and steel industry in view of pending Government inquiries. The Senate resolution referred to asks the commission to ascertain the organization and interrelations of interests engaged in the house furnishing goods industry and whether there are unfair practices and methods of competition or restraints of trade, combinations or manipulations "out of harmony with the law of public interest, and if so, what effect the same have had on prices; and, serially to report the facts with its recommendations at the earliest possible time, as phases of the investigation are completed."

Hearing on Pig Iron Rate

ST. LOUIS, Oct. 2.—J. L. Koch, an examiner of the Interstate Commerce Commission, held a hearing at Hotel Jefferson recently to take testimony in objection to and in support of the new rates on pig iron from Birmingham to Ohio River crossings. The lower rates were to have gone into effect on Sept. 1, but were suspended as a result of protests.

Combination Crane and Shovel

In THE IRON AGE of April 14, 1921, was described the crawling tread crane of the Orton & Steinbrenner Co., 608 South Dearborn Street, Chicago. The machine has now been developed so that it is a combination crane and shovel. It is designed so that the crane boom may be removed in a short period of time and

The Crane Boom May Be Removed and the Shovel Boom Substituted, as Shown

a shovel boom substituted therefor, so that the crane may be readily converted from a clam shell rig to a steam shovel. The radius of the boom instead of being fixed at a certain degree, may be varied to suit the conditions of the job, making it possible, for example, to dig several feet below the normal operating level as well as increase the lift.

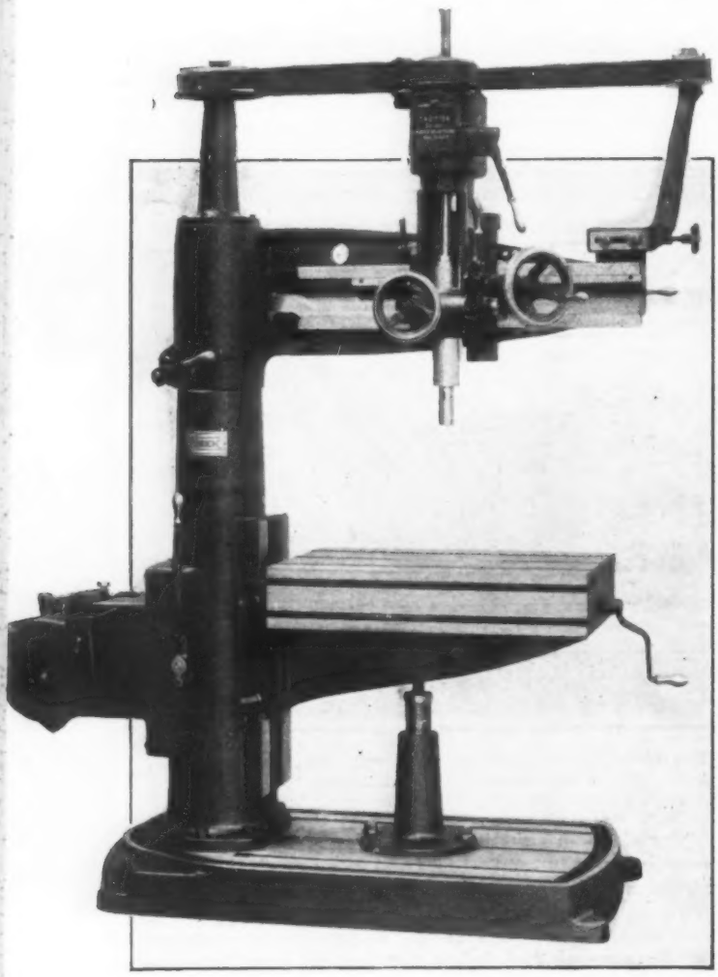
Motive power is supplied by only two engines. The hoisting, swinging and travelling operations are performed with double clutches by the main non-reversing engines, while the crowding motion of the dipper is actuated by a separate reversing engine placed midway along the boom. The rotating base turns on a live ring of rollers on a large diameter rail circle, thus to distribute the load evenly without requiring much power to swing.

The Electrical Alloy Co., Morristown, N. J., announces a new publication, "Electrical Heating Reference Data," embodying the experience and suggestions of an expert on electrical heating. It discusses the method of determining the material adapted to certain specific conditions, and the proper size and length of resistance wire to be used, and offers suggestions for the actual designing of the heating element. The current-carrying capacity of resistance ribbon and strip is published. To make the bulletin complete as a reference work, the publishers have included numerous reference tables for which the engineer or designer has daily need.

Fosdick High-Speed Ball Bearing Sensitive Radial Drilling Machine

The accompanying illustration shows a radial drilling and tapping machine recently developed by The Fosdick Machine Tool Co., Cincinnati. The object of the machine is to drill and tap work of too large an area for the high-speed sensitive upright drill, yet drilling and tapping small holes in the work which require much greater speed than is attained on the heavy duty type radial machine. Rapidity of positioning the drill, together with ease and convenience of operation is emphasized as minimizing the time "between holes," while high speeds and excess power reduce the actual drilling time.

The table is readily removed, allowing 49½ in. between the spindle and the base, which has a working surface of 28 x 36 in., and is planed and provided with



Machine for Speed Drilling and Tapping Work of Too Large an Area to Be Well Served by a Sensitive Drilling Machine

T-slots. The vertical movement of the table is 16 in. through a ball bearing telescopic screw. The working surface is 20 x 33 in., with 31 in. maximum to the spindle.

The arm may be swung completely around the column, and is supported on both annular and thrust ball bearings on the column, which extends through to the top. The spindle, as all other revolving members, is equipped with ball bearing journals. It has a No. 2 Morse taper, and a vertical traverse of 8 in. The horizontal movement of 28½ in. along the arm is through rack and spiral gear with handwheel at the right. This position of the handwheel enables the operator to swing the arm and move the head simultaneously with the right hand, while the left hand is free to raise and lower the spindle and clamp the arm. The sensitive feed and quick return are operated by the lever at the right, or the handwheel at the left.

Friction back gears, a new feature, permit instantaneous shifting from high drilling speeds to slow speeds for tapping or drilling the larger holes, the ratio being 4½ to 1. The tapping attachment frictions, like those of the back gears, are adjustable with an ordinary screw driver. The drive is regularly through tight and loose pulleys on the machine, which gives both a high and low speed forward and reverse. The pulley guard and belt shifter are adjustable to meet the belt from any angle.

A reservoir for coolant is cast in the base, and a pump with nozzle to the drill point may be supplied. Separate box or universal tables can be furnished as extras in place of the regular elevating rectangular table. Motor driven machines require a 1-hp. motor, either constant or variable speed, as desired. The machines are built with either 3 or 3½-ft. arms; the dimensions mentioned are for the 3-ft. size, which weighs 2650 lb.

Fewer Metal Workers and Higher Wages

Iron and steel plants, according to figures of the Bureau of Labor Statistics, show for August a loss from July of 1770 employees in 125 establishments. This loss of 1.4 per cent was accompanied by a gain of 13.8 per cent in amount of payroll and a corresponding increase in the average pay envelope from $42.08 to $48.45, or 15.1 per cent.

In the automobile industry there was a loss in 97 establishments of ½ per cent in number of employees, but an increase of 9.1 per cent in payroll total. In car building and repairing there was a loss of 5 per cent in number of employees in 72 establishments and a gain of 25.8 per cent in amount of payroll.

Compared with a year ago there has been a gain, all told, of 28.5 per cent in number of men employed, and an increase of 33.9 per cent in total payroll. This connotes a gain of 4.2 per cent in contents of the average pay envelope, which has advanced from $57.03 to $59.40.

Wages per half-month per man in automobile plants, which are exceptionally busy, are 44.3 per cent over those prevailing in steel plants. In fact, 152,827 automobile workers received over $3,260,000 more in the half month than did 153,260 steel workers.

Compared with July, per capita earnings increased in 29 industries and decreased in 13. Carbuilding and repairing led the increases with an advance of 32.4 per cent; iron and steel came next, with 15.1 per cent and automobile building third, with 8.6 per cent. Among the others, agricultural implement makers advanced 5.3 per cent; stove makers, 4.4 per cent; hardware makers, 3.2 per cent; electrical workers, 2.9 per cent; steel shipbuilding, 1.4 per cent. Details are shown in the table.

Period	Number of Establishments	Number of Men	Half-Month Payroll	Average Pay Envelope
Iron and Steel				
July, 1922.....	125	155,030	$6,523,949	$42.08
August, 1922.....	125	153,260	7,424,212	48.45
August, 1921.....	112	103,458	4,348,589	42.03
*Automobiles**				
July, 1922.....	97	152,147	9,792,560	64.37
August, 1922.....	97	152,827	10,685,454	69.92
August, 1921.....	48	99,207	7,084,458	71.41
Car Building and Repairing				
July, 1922.....	72	52,319	2,134,427	40.80
August, 1922.....	72	49,732	2,685,339	53.99
August, 1921.....	55	33,561	2,041,073	60.82
Metal Workers (the three groups above)				
July, 1922.....	215	359,496	18,450,936	51.32
August, 1922.....	294	355,819	20,795,005	58.44
August, 1921.....	215	236,226	13,474,120	57.03

*Payroll figures are reported as "weekly"; they have been made "half-monthly" by multiplying by 2 1/6.

At the annual meeting of the Cincinnati Association of Purchasing Agents, J. G. Kreis of the Weir Frog Co., was elected president. T. W. Marz, Newport Rolling Mill Co., and E. W. Simpkinson, of the F. H. Lawson Co., were elected vice-presidents. Fred G. Berling, Lunkenheimer Co., and J. H. Heitbrink, Morris Machine Tool Co., were elected secretaries. G. E. Merkel, Allis-Chalmers Mfg. Co., was re-elected treasurer. The election of officers followed the annual dinner, which was attended by practically the full membership of the association. T. W. Marz delivered an address on the "Development and History of Coal Mining."

Car Shortage Greatly Retards Shipments

Movement of Iron and Steel Products Delayed at Many Points—Large Tonnages Piled in the Youngstown District

YOUNGSTOWN, Oct. 3.—Inadequacy of car supply in the Mahoning and Shenango Valleys is seriously interfering with shipments of finished and semi-finished steel products. At the close of last week approximately 50,000 tons of steel were piled in Valley plants because of lack of cars to move mill output. The Republic Iron & Steel Co. has been obliged to suspend eight of the 16 sheet mills at its Niles plant because of its clogged condition. Fully 11,000 tons of sheet products were piled at this plant, awaiting shipment.

Of the delayed shipments, products requiring box cars, such as sheets, tin plate and plates, are in preponderance. A survey revealed 4200 tons of semi-finished piled at the Ohio Works of the Carnegie Steel Co.; 3600 tons, mainly bars, at the McDonald plant of the Carnegie company; 4000 tons at the Brier Hill plants; 2500 at the Youngstown Sheet & Tube mills and 12,000 at the Republic company's various properties. Material ready to be shipped by other Valley interests made the total fully 50,000 tons.

One Valley interest is taking advantage of the situation to balance and replenish its pipe stocks.

Where expedient, products of the mills are being delivered by motor truck. One such consignment from Youngstown to Pittsburgh involved 1000 tons, and the consumer expressed willingness to pay the additional hauling charges in order to obtain the material.

Coal Moves More Freely

With exception of low volatile grades, coal is moving into the district freely. A large interest, normally consuming 135 carloads daily, reports that shipments are at normal. Operators of by-product coke ovens in general complain that low volatile coal is being held up and supplies are inadequate. Much of such coal consumed in this territory comes from West Virginia, and congestion on roads tapping these mines is held responsible for the tardy shipments.

Limestone shipments are likewise being delayed, and furnace operators have been obliged in consequence to make inroads into reserve stocks. A Valley independent reports that limestone coming from Martinsburg, W. Va., has been cut off because of the disorganized car situation.

In view of the restrictions on movement of both raw materials and finished steel, due to lack of cars, district steel interests have requested the Interstate Commerce Commission to modify Priority No. 25, which limits open top cars with sides 42 in. in height or over to coal movement. Such cars may be loaded, however, with construction supplies and other classes of materials, when proceeding in direction of the mine. This provision has permitted the shipment of pipe in some cases.

An embargo imposed by the Baltimore & Ohio Railroad against coal shipments to its lake ports is relieving the stress to some extent, releasing mill type gondolas for the steel industry. The carrier's lake docks are loaded with coal and heavy tonnages are en route.

Shortage of Box Cars Acute

Shortage of box cars is acute. Traffic officials say that the scarcity is due to the diversion of box cars at this season to the West for the grain movement.

In mapping out operating schedules for the week, mill managers explained they are subject to change, dependent altogether on the car situation. Car supply is wholly irregular from day to day and shows many variations in the number of cars available for the steel plants.

Approximately 101 sheet mills were scheduled at the week's commencement. Falcon Steel Co. has been obliged to suspend part of its complement, four of its eight sheet mills being on the inactive list. There are therefore 12 less sheet mills active this week than last, in the Mahoning Valley.

Furnace and Mill Operations

Starting of Anna blast furnace by the Struthers Furnace Co., scheduled to go in Oct. 2, has been delayed until the latter part of the week because of interruptions to coke shipments. With this stack active, 25 of 47 in the two Valleys will be pouring, representing about 68 per cent of total iron capacity. Active ingot capacity continues at 85 per cent, while all three Bessemer converters in the Mahoning Valley are blowing.

In some instances mills are being inconvenienced by insufficiency of labor supply. This condition would be more pronounced if average operations were at a higher level and were not retarded by car scarcity. To prevent the working force of its Farrell, Pa., plant from disintegrating during idleness of the property, the Carnegie Steel Co. is giving such workers employment at other plants nearby, such as Youngstown and New Castle.

The Farrell plant is ready for resumption, but a shortage of coke and steel is delaying the order. Steel shortage is likewise hampering the independents. One interest would operate its plate mill on merchant tonnages except for this condition.

Locomotives Out of Repair

WASHINGTON, Oct. 3.—Locomotives out of repair showed an increase in number on Sept. 1 as compared with Aug. 15 and Aug. 1, according to the American Railway Association. On Sept. 1 there was a total of 64,294 on the lines, of which 16,260, or 25.3 per cent, required heavy repairs and of this latter number 9660 were freight locomotives and 3120 switching locomotives. On Aug. 15 the total number on the lines was 64,296, of which 15,312, or 23.8 per cent, required heavy repairs, and of this number 9107 were freight and 3027 were switching locomotives. On Aug. 1 the total number on the lines was 64,270, of which 14,505, or 22.6 per cent, required heavy repairs. Of this number 8594 were freight and 2893 were switching locomotives. Normally it is estimated that approximately 18 per cent of the locomotives of the country require heavy repairs, so that at present the number requiring this class of repair work is approximately 40 per cent over the normal, while the percentage of cars requiring repairs is about 100 per cent over the normal total, which is about 7 per cent of all cars, but is approximately 14 per cent to-day. ["Heavy repairs" means repairs requiring more than 24 hr. work.]

Sheet Shortage Feared at Detroit

DETROIT, Oct. 2.—The threatened unemployment situation in Detroit, due to the fuel and railroad tie-up has been overcome in the making. Figures of the Employers' Association of Detroit substantiate this in their report as of Sept. 26, which shows a net increase of 63,500 over the week previous, or a total of 165,000 employed as reported by the 79 members of the association. Several increases during the week are not reported in the above totals, so that the actual number employed this date is less than 10,000 below figures given two weeks ago.

Automobile production continues at a high rate with closed body models predominating. Maintaining schedules is a traffic problem both as to assembling and delivery on cars. The Interstate Commerce Commission has been appealed to for more cars to handle ship-

ments of automobiles from factories in the Michigan district. Several local railroad officials have been instrumental in this movement, requesting that all carriers utilize to the fullest extent standard box cars for the handling of priorities so that any surplus will be in the shape of automobile box cars. The carriers are likewise loading automobile cars wherever possible on shipments for delivery in this district.

Reports this week that one or two sheet producers that supply this district had curtailed their production due to lack of shipping equipment, caused manufacturers to be menaced by lack of this material. Deliveries at best have been only for current needs. Fuel has been reaching Michigan industries in sufficient quantities to relieve any threats of a shortage. The threatened strike of sailors of the Great Lakes carriers will not affect coal shipments to Detroit, as the small tonnage transported by water is carried by small vessels not members of the association.

Car Shortage in Connellsville Region

UNIONTOWN, PA., Oct. 2.—The past week has been marked by an acute car shortage in the Connellsville bituminous region and a falling off in price quotations for coal. Coke production is showing a material increase, although the principal output is for contract or use by the Steel Corporation.

Coal production in the region reached 105,340 tons for the week ending Sept. 23, within 40,000 tons of the production on April 1 when the sympathetic strike in the region developed.

Coke production in the region for the week ending Sept. 23 follows: Merchant, 24,390 tons; furnace, 80,950 tons; total, 105,340.

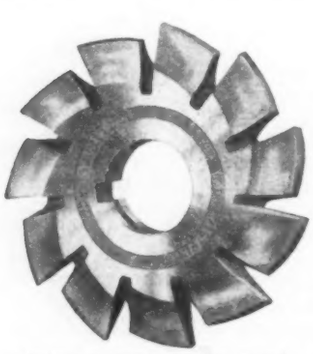
The production for the same week in 1921 was 43,760 tons. The total coke production in the Connellsville region so far this year is 3,247,450 tons as compared with 2,561,500 tons during the same period last year. Three additional plants and 684 ovens were placed in operation during the past week.

The strike has ceased to be a serious factor in the production in the Connellsville region. Output now is hampered principally by shortage of power and cars affecting all railroads in the region but being especially serious for plants shipping by the Baltimore & Ohio.

The newly organized Fayette Greene Coal Producers' Association has established headquarters in Uniontown at 46 East Main Street. The officers of the association are: George Whyel, president; W. W. Parshall, vice-president; E. D. Brown, secretary-treasurer, and J. Fred Shean, executive secretary.

Ground-Form Gear Cutters

The ground-form gear cutter shown in the accompanying illustration, which as its name implies, is ground on the tooth form, is a recent addition to the line of the Brown & Sharpe Mfg. Co., Providence. Grinding of the tooth form is intended to correct hardening distortions, give each tooth great accuracy of form and aline all teeth with the hole in the cutter. Longer cutter life is also a feature emphasized.



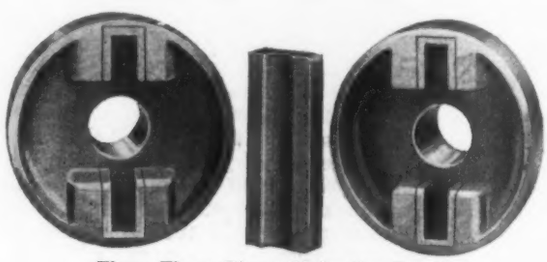
Cutter Ground on the Tooth Form

The tooth form of the cutters, being accurate to close limits, the tooth spaces of the gears will correspond, the alinement of the cutter teeth contributing also to accuracy in the spaces between the gear teeth. Grinding of the tooth form also gives a positive method of controlling the form of different cutters and securing duplicates, the latter being of particular importance perhaps to the manufacturer of gears in quantity where both accuracy and uniformity are required. The ground form cutter is intended therefore to solve a difficult problem in providing for the duplication of accuracy.

Free cutting action due to each tooth doing its share, and the keener cutting edges formed by the conjunction of the ground surfaces of the teeth, the latter feature serving also to greatly increase the production capacity, are features emphasized. Faster feed and the ability to cut more gears between resharpenings are claimed, the long life of the cutter being said to be due to the work of cutting being evenly distributed among all teeth, eliminating localized heating, which is one of the commonest causes of cutter wear. Another factor adding to the life of the cutter is that grinding of the form gives the teeth a positive clearance, eliminating "rubbing" of the form back of the cutting edge. The cutters are available in sizes from 1¾ to 12 pitch, inclusive.

Tilting Bar Flexible Coupling

While the tilting bar flexible coupling has been manufactured for some time, it has not been pushed on the market. Now the American Foundry & Mfg. Co., Frederick, Md., has taken it up. The coupling is of simple construction, being made of three parts, two



These Three Pieces Make the Coupling

flanged hubs with sockets in their faces and a steel bar fitting into the sockets.

Flexibility is obtained by the tilting and sliding of the bar in its sockets. In this manner misalinement is taken care of without throwing extra strain on the bearings of the two connected shafts. Driving being done through solid metal parts, none subject to deformation, the chances for breakdowns are considered to be practically eliminated. A number of these couplings have been in service, it is stated, for eight years without maintenance or repair, taking care, in some instances of misalinements up to 1/16 in. Breakdown tests have shown a factor of safety of about 12.

The flexibility of the coupling ranges from 1/16 in. in the smaller sizes to ⅛ in. in the larger, for parallelism, and up to 7 deg. for angularity. Its ability to take care of endwise motion of the shafts is regarded more than sufficient to meet any demand put upon it in practice. Standard sizes, designed for shafts ⅞ in. to 6½ in. in diameter, may be supplemented by larger sizes when ordered.

Springfield, Ohio, Industries Active

SPRINGFIELD, Ohio, Oct. 2.—A voluntary increase of 10 per cent in wages, effective Oct. 1, was announced Saturday by the Superior Gas Engine Co. This affects 500 men. The increase applies to hour men and others on premium work. A marked improvement in business has been experienced by the company in the past ten days. P. J. Shouvlin is president.

A gradual improvement in the machine tool business is reported by Edward Montanus of the Springfield Machine Tool Co. Orders are coming in and the force is being increased.

The American Radiator Co.'s plant in this city is keeping up to its heavy schedule, which it has maintained since last December. The local management reports that prospects are that the plant will be operated with a large force during the fall and winter.

Production of motors is being speeded up at the plant of the Robbins & Myers Co. Officers say October will be the best month in the output of motors in two years. More than 1200 persons are now employed.

Three-Company Steel Merger Abandoned

Midvale, Republic and Inland Officials Give Up Plans, Owing to Attitude of Federal Trade Commission —Surprise Expressed at Washington

THE plans for the consolidation of the Midvale Steel & Ordnance Co., the Republic Iron & Steel Co. and the Inland Steel Co. into one corporation to be known as the North American Steel Co., were abandoned Thursday, Sept. 28.

At the office of T. L. Chadbourne, legal adviser to those interested in the merger, the following statement was issued:

"W. E. Corey, chairman of the board of the Midvale Steel & Ordnance Co., John A. Topping, chairman of the board of the Republic Iron & Steel Co., and L. E. Block, chairman of the Inland Steel Co., have authorized the following statement:

"'At a meeting held to-day the entire situation arising from the action of the Federal Trade Commission was reviewed and the conclusion was reached that under existing circumstances, it is not possible to proceed with the proposed merger of the Midvale Steel & Ordnance Co., the Inland Steel Co. and the Republic Iron & Steel Co. While all of the eminent counsel who have been consulted agree that the proposed merger would be legal in every respect, and while its consummation would not have restrained but have intensified competition, the final determination of the questions involved would delay the carrying out of the plan to such an extent that the parties in interest do not deem it advisable to proceed. Pending such final determination of the questions involved, the financing of the proposed merger would not be possible and it is not feasible to proceed with the merger without such financing.'"

The legality of the merger of the three companies was attacked by the Federal Trade Commission in a report filed by that body as reported in THE IRON AGE of Sept. 7.

Washington Officials Surprised

WASHINGTON, Oct. 3.—Decision of officials of the Midvale Steel & Ordnance Co., Republic Iron & Steel Co. and the Inland Steel Co., to abandon their proposed merger, owing to proceedings instituted against them by the Federal Trade Commission, evidently came as a surprise to the commission when it was informed last Thursday afternoon by long distance telephone through a legal representative of the companies of the action taken. It was clearly the belief in official circles in Washington that the merger would proceed regardless of the complaint of the commission. The fact that the legality of the merger, so far as the Sherman, Clayton and Webb-Pomerene acts were concerned, had been upheld by the Department of Justice strengthened the opinion that it would be consummated. The complaint of the commission, however, was brought under the Federal Trade Commission act, and as in the case of the proposed merger of the Bethlehem Steel Co. and the Lackawanna Steel Co., alleged unfair methods of competition. Judge Van Fleet, a member of the commission, filed a vigorous dissent to the Midvale-Republic-Inland complaint and asserted that in view of the fact that this merger would represent only 7½ per cent of the steel output, as against approximately 45 per cent represented by the United States Steel Corporation, the commission was "straining at a gnat and swallowing a camel." He went on record as saying the merger would be in the public interest.

The abandonment of the merger is believed here to have been due to the unwillingness of bankers to finance it in view of the commission's complaint and because of the costs that would be involved pending a final decision in the proceedings. It is assumed that as a matter of form, and for the purpose of permitting the commission to close its record, written notice of abandonment of the merger will be sent to the commission.

President Grace's Statement

Following the announcement of the decision to abandon the three-company merger, Eugene G. Grace, president Bethlehem Steel Corporation, issued a statement in which he pointed out that the abandonment of the plan to merge the Republic, Midvale and Inland Steel companies because of the objections raised by the Federal Trade Commission, will in no way affect the recent taking over of the Lackawanna Steel Co. by Bethlehem.

"The decision of Midvale, Republic and Inland not to merge should have no significance whatever for persons interested in our acquisition of Lackawanna" said Mr. Grace. "The Bethlehem-Lackawanna combination already is virtually a fact, and the last step, the actual exchange of securities, will be made just as soon as possible, presumably within the next two or three weeks. The stumbling block for Midvale, Republic and Inland, floating securities of a new company in the face of a Federal Trade Commission complaint, we have not had to contend with and will not have to contend with at any time. The additional $15,000,000 preferred stock for plant improvements, which it is planned will be a regular Bethlehem security, will be beyond the pale of any Federal Trade Commission action."

Merger Abandoned—Brier Hill Steel Co. Will Make Extensions

Following failure of merger plans, the Brier Hill Steel Co., Youngstown, Ohio, is arranging to proceed with extensions to round out its finishing capacity. The first step in this program has been the disposal of $10,000,000 of first mortgage bonds to the Guaranty Trust Co., New York. The bonds will bear 5½ per cent interest. Proceeds will be used to finance expansion and changes.

The extensions will probably take the form of a strip steel mill, two lapweld tube mills and reconstruction of the company's 132-in. plate mill, so that it may be used as a sheared skelp mill. The strip unit will also be of such construction that it may be used as a small skelp mill, when necessary. Other extensions will probably be made at a later date, according to the program which has been outlined.

Only semi-official approval has been given the expansion outlined, and some deviations may therefore be made. Recently the company authorized the expenditure of $1,000,000 to modernize and improve its Thomas plant at Niles, a 12-mill sheet interest.

Decision by the Brier Hill company to proceed with an expansion program likely eliminates it from further merger negotiations at this time. Its representatives attended the negotiations connected with the originally proposed seven-company merger, which finally resulted in the Midvale-Republic-Inland combination, which collapsed last week.

Subsequently, efforts were made by the Brier Hill company to effect an amalgamation with the Trumbull Steel Co., but these plans fell through. On Tuesday, Sept. 26, directors of the Youngstown Sheet & Tube Co. attended a special meeting called by President James A. Campbell to consider a combination with the

Brier Hill properties. The plan was not to the liking of Sheet & Tube company interests, however, for Mr. Campbell issued a statement on Sept. 27, that directors were of the opinion the company should not further increase its investment in the Youngstown district.

"Brier Hill Steel is a splendid property," he stated, "with valuable ore and limestone properties, new and up-to-date blast furnaces, steel plant and finishing mills, but it is not so well balanced as it might be. With some additions in finishing capacity, it can be made a very strong and well rounded property."

Mr. Campbell denies reports that his company may be interested in a merger with the Inland Steel Co. It is considered likely, however, that the Sheet & Tube company will now direct its attention toward the establishment of a Chicago district manufacturing connection, either through construction of a plant, or acquisition of a going property producing pipe.

New Bethlehem Steel Co. Appointees

THE changes in the operating and sales departments of the Bethlehem Steel Co. due to its absorption of the Lackawanna Steel Co., announced in THE IRON AGE of Sept. 1, have become effective. George W. Whitehead, who has been appointed assistant general manager of the plants at Lackawanna, N. Y., started to work for the Illinois Steel Co. in 1900 and continued there until 1904, when E. A. S. Clarke became president of Lackawanna Steel Co. He then became connected with the Lackawanna company and served it as Bessemer superintendent, assistant general superintendent and general superintendent.

GEORGE W. WHITEHEAD

Robert E. Belknap, appointed district manager of sales Bethlehem Steel Co. at Boston, is a native of Yonkers, N. Y., and a graduate of Johns Hopkins University. After a few years with engineering contracting firms, Mr. Belknap joined the sales force of the Pennsylvania Steel Co. in 1901. In 1902 he went to Chicago, where up to that time the company had no representation. In 1906 he was promoted from assistant district sales manager to manager of sales of the Chicago district. He remained in that position until 1915, when he was appointed district sales manager in New York. In 1916 when the Pennsylvania Steel Co. was absorbed by the Bethlehem Steel Co., he returned to Chicago as district sales manager of the latter company. He has held this position continuously up to the time of his recent transfer to Boston.

ROBERT E. BELKNAP

R. B. WALLACE

FRANC H. BURNETT

E. B. C. GOYNE

R. B. Wallace, who continues at Boston as assistant manager of sales, entered the steel business with Bethlehem Steel Co. in 1909 and became its Boston agent in 1917.

Edward S. Illig, new Buffalo district sales manager, has been identified with the Bethlehem Steel Corporation since leaving college, almost 20 years. He started in the operating department of the Bethlehem, Pa., plant and after becoming fully acquainted with the manufacture of steel, in 1904 was assigned to the Pittsburgh office, becoming assistant sales agent in 1906. In 1907 he was transferred to the San Francisco office and placed in charge of Pacific coast sales of the company, holding this position until 1916. He then was transferred back to the Pittsburgh office and made manager of sales.

E. B. C. Goyne, formerly in charge of sales at St. Louis, succeeds Mr. Illig at Pittsburgh. Mr. Goyne's career is unusual because he left work to enter college. His first employment was with the American Locomotive Co., in 1901. After shop and drawing-room experience with it until 1908, he left to enter preparatory school, spending two years there, and then entering Lehigh University for a four-years' course in mechanical and civil engineering. In 1911, while at college, he did his first work for the Bethlehem Steel Co. After leaving Lehigh in 1914, Mr. Goyne did civil engineering work in connection with excavating and concrete construction until 1915, when he entered the Bethlehem service in machine operations on munitions work. He spent several months later in the open-hearth department, entering the sales department in July, 1916. In 1917 he was sent to St. Louis as district sales manager.

In connection with the re-organization of the executive departments of the Lackawanna mills of the Bethlehem Steel Corporation, Timothy Burns, general manager, announces several designations. Franc H. Burnett, formerly general purchasing agent of the Lackawanna Steel Co., has been named assistant to the general manager. Mr. Burnett entered the steel industry in 1895 at the Joliet works of the Illinois Steel Co. In 1904 he went to Lackawanna as assistant purchasing agent and in 1910 became general purchasing agent. C. B. Minnes, formerly assistant purchasing agent of Lackawanna, takes the designation of assistant to the purchasing agent of the Bethlehem Steel Corporation, with offices at Lackawanna. Harry J. Kelly, formerly assistant superintendent of the Lackawanna Steel Co., is appointed superintendent of rolling mills. H. F. Miller, also a former Lackawanna assistant superintendent, is appointed superintendent of open hearth and Bessemer departments.

Practically all of the 250 workers at the Ames Shovel & Tool Co. plant in the Brockton, Mass., district have gone on strike.

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ESTABLISHED 1855

THE IRON AGE

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International Debts and Trade

We have had now nearly four years of failure of international trade to get on a working basis, and with the passage of our tariff act emphasis needs to be laid upon the fact that something must be done. It ought not to be necessary to emphasize the point, since the circumstances stand out so plainly, but there is widespread and marvelous ignoring of the circumstances.

A debt of about 11 billion dollars is owed us by foreign governments. There are many who insist that this is a real debt. The attitude of our Government is that it is a real debt, since machinery for its "funding" has recently been established. Our "favorable merchandise trade balance" was about 4 billion dollars in 1919, 3 billions in 1920 and 2 billions in 1921. For the 47 months following the armistice the total may be taken at 10 billion. The two items would make a total due us of 21 billion dollars. There are other items, the net influence of which would be to reduce this total somewhat, but for the long range view a few billions one way or the other would matter little.

A large part of the excess of our merchandise exports has been funded in various ways. A portion of the indebtedness remains unfunded. It is more or less a detail whether the indebtedness is funded or unfunded.

Before the war we had an unseen balance against us of about half a billion dollars a year. This was equalized by our merchandise exports exceeding our merchandise imports by this amount. There is little if anything left of this unseen balance, and for a broad view the item may be ignored. Lately our merchandise trade balance has been running in our favor, to use the common phrase, by three-quarters of a billion a year. Five per cent on 20 billion would be 1 billion, so that we seem to be looking for payment to us of about 1¾ billions a year, not to speak of any repayment of principal. Yet we are complaining that our exports are not large enough.

In the early months of this year the country was absorbing foreign loans with considerable avidity. These loans represented a funding of old obligations rather than the establishment of credits for fresh merchandise purchases in the United States. Now such loans are not in demand, their flotation having become quite difficult. Such funding merely postpones payment, and meanwhile interest obligations must be met or be allowed to pile up, increasing the total upon which interest is expected.

If before the war any one had ventured to prophesy the condition now existing he would have been ridiculed. Various positive proofs of the impossibility would have been presented. One argument would have been that no country could grow so rich. Another would have been that if on paper it did grow so rich the obligations would not be worth their face.

Apart from the serious question of whether these debts are good, there is the riddle that we want payment while our debtors cannot pay, and we do not wish to accept payment; for when the practice of adding the interest to the principal stops, the interest must be paid in merchandise.

As to the European countries being unable to pay, the figures of their merchandise trade recently are impressive. In the first six months of this year the United Kingdom had imports 20 per cent above the exports, while France had an excess of 14 per cent. Italy in four months had imports approximately double its exports. Germany, which is expected to pay reparation, had imports 9 per cent above exports. The countries that are expected to make payments have been importing more than they exported, while the country that expects to receive payment has been exporting more than it imported and actually wants to increase this merchandise balance.

Activity in the tin plate branch of the British steel industry is marked and approaches pre-war proportions. This is not true of most other branches. At the end of June, 471 British tin plate mills were operating, which was the largest number for the year. At the peak of activity in the last four years, 514 mills were operating at the end of June and July, 1920. The recent prosperity is also reflected in British tin plate exports, which for this year averaged 37,270 gross tons per month to Sept. 1, or only about 3000 tons per month less than the average for 1912 and 1913. In contrast to this, the American export move-

ment, while only about 20 per cent in volume, at an average of 6300 tons per month to Aug. 1, this year, is practically equal to that of 1913. Of only one other steel product does Great Britain export more than of tin plate, and that is galvanized sheets, in which to Sept. 1, the 1922 movement averaged 43,800 tons per month. This is much less, however, than the pre-war rate, galvanized sheets having long been the premier export product of the British steel industry. Current world demand for tin plate may be said to be nearly equal to that before the war.

The Elastic Tariff Provisions

The announcement by the National Automobile Chamber of Commerce that immediate action under the elastic powers accorded the President by the new tariff law will be asked by representatives of the automobile industry who are arranging for a conference with the Tariff Commission in Washington is an indication that these provisions will not be allowed to lapse into desuetude. Our manufacturers of automobiles have enjoyed an important share in the world's business in motor vehicles and hope to retain it if Washington acts in accordance with their plans.

As the duty on automobiles has been reduced to 25 per cent, manufacturers believe that this is a basis for uniformity of tariffs in all countries. France now has a duty of 45 per cent on American cars. Italy has been collecting 35 per cent plus a duty based on weight, and the United Kingdom has a duty of 33 1/3 per cent. It is believed these duties could be adjusted easily to conform to the American tariff. The problem as to the colonies is not so easy. Mother countries have favored their colonies to the great disadvantage of American exporters. To meet this condition, the President, under the new law, can increase the duties by 50 per cent on products from any country that does not accord fair treatment to American commerce. Still other discriminations exist, in addition to those resulting from colonial policies, and it is pointed out as an example that Finland is allowing a French exporter a duty of only one-fourth of that charged the American shipper.

Automobile manufacturers have many grievances, as have other manufacturers, and the taking of the action above referred to is likely to be followed by similar proceedings, so that the President and the Tariff Commission will have a large number of important investigations to make. For this reason it is being urged by some writers in the newspapers and magazines that the President will be overwhelmed on account of the great weight which will be added to his already heavy burden. Doubtless the new provisions of the tariff act will add somewhat to the President's duties, but by far the greater part of the work connected with investigations will be carried on by the Tariff Commission and its large corps of assistants. Other Presidents of the United States have undertaken most important investigations, particularly in connection with the settlement of international boundary disputes, but no one imagined for a moment that the President himself would devote any large amount of time to the details of such investigations. Under the new law, the President will owe it as a duty to himself and to the country not to assume any burdens that can be entrusted to the Tariff Commission.

The country will share the hope of the President that much may be accomplished under the so-called elastic provisions of the Fordney-McCumber act. The question of their constitutionality has not yet been determined, but probably will be before many months and then, if the decision is affirmative, the manufacturers will have an opportunity to present their causes with the assurance that orders issued by the President, following investigations by the Tariff Commission, will be carried out. It will then behoove manufacturers to make appeals to Washington only when there is substantial ground for such action and to make the presentation of their cases as clear-cut and concise as possible.

The Advance in Alloy Steels

The fact that ferroalloys were the chief subject of contention in the preparation of the metal schedule of the Fordney-McCumber tariff is some measure of the new place alloy steels have taken in only recent years. The war had brought out in strong relief the resources of various countries for the production of special steels, giving their armies and navies preponderating strength, and thus a new factor has entered into the international reckoning in respect to certain metals. With all that was learned in the four years following 1914, of the military value of alloy steels, developments since the war make it quite evident that their advance in the industries of peace will be more rapid than ever. From being thought of during the war chiefly as military and political essentials, they are now being recognized in certain industries as absolutely necessary to the maintenance of a competitive commercial position.

An article on page 791 of THE IRON AGE of Sept. 28 showed how, from the small proportions of 1909, when the first statistics of their production were gathered, alloy steels have now come to occupy an indispensable place. In 1909 less than 1 per cent of the total steel production of the country was alloy steel. In 1917, when steel ingot and castings output reached high point at 45,060,607 gross tons, alloy steels were 1,644,335 tons, or 3.65 per cent. In 1921, despite an almost unparalleled industrial depression, and with a total steel production four million tons less than in 1909, the alloy steel output was nearly 4½ times as large as in the first statistical year. Of the 809,500 gross tons of alloy steel made in 1921, or 4.10 per cent of the total, a large proportion went into automobiles, particularly as forgings, and the locomotive industry also had an important place as a consumer of both forgings and castings.

The most spectacular feature of the alloy industry, as indicated in a diagram accompanying last week's article, has been the rise in the curve representing alloy castings made in electric furnaces. Such castings represent in part competitive substitutes for carbon steel forgings—a development admittedly having large possibilities. A comparatively recent factor is the production of large rolls of iron and steel which, after special

heat treatment are found to have superior properties.

In the non-ferrous industry, improvement in established alloys and the introduction of new ones are making such strides that it is difficult to keep pace with them. In industrial importance and metallurgical value these developments quite equal those in alloy steels. Brass and aluminum alloys are familiar, and more recently magnesium alloys have attracted attention. Aluminum and magnesium in steel have made air-plane progress more rapid, and are responsible for the all-metal plane. In the field of heat treatment non-ferrous alloys are notable in having made possible the electric resistance furnace.

The proceedings of the engineering societies and the pages of technical periodicals tell the same story as the statistics, of the march of the special steels. The space they thus occupy to-day probably represents not less than the ratio of 4½ to 1 between the production figures of 1921 and those of 1909. Their increasing importance finds fresh recognition in the program of the American Society for Steel Treating at Detroit this week, and that of the American Iron and Steel Institute, soon to be held in New York.

Economy in Railroad Operation

The general public probably does not realize the amount of trust it has placed in railroad officials by enacting the present transportation act. The act prescribes that railroad rates shall be such as to yield a certain annual percentage upon the value of railroad property. For the first two years of the act, or to March 1, 1922, this rate was to be 5½ or 6 per cent, according to the judgment of the Interstate Commerce Commission, the rate thereafter to be such as the commission should prescribe. The current rate, as fixed by the commission, is 5¾ per cent. Should a road earn more than 6 per cent, there are provisions as to the excess that make the chances of any road regularly disbursing to security holders more than 6 per cent relatively remote.

The important point about this arrangement, a point that hardly receives the attention it should, is the close connection between rates and investment. The connection is not between rates and service. Were there no restrictions, the position would be that no matter how much money the railroads should "invest" there would be a return practically assured upon that sum. It is true there are restrictions but they do not remove the general underlying principle. It is prescribed that the railroads shall be economically operated, but the act does not define any standard of economy. Expenditures for improvements must be sanctioned by the commission.

Yet with the restrictions the fact remains that the public has reposed great confidence in the men who operate the railroads, in trusting them to run the railroads with economy and efficiency. In nearly all other commercial enterprises the managers have the direct incentive of profit. The smaller the capital investment the enterprise can get along with, the greater the relative return. Any replacement of the ordinary laws of trade in favor of a system that would give a manufacturer or dealer a profit dependent upon the investment he chanced to have would be considered absurd and directly contrary to public policy.

The transportation act has not been criticized on account of this provision. Its labor provisions have been criticized very severely, yet it is not considered altogether probable that it will be amended in that respect. Thus there is no likelihood of its being amended in respect to the principle governing the making of rates. Accordingly, the public can expect to pay rates for an indefinite number of years that are based as nearly as circumstances may permit upon the investment.

Ideas that have long outlived their usefulness often die hard. It used to be the universal belief throughout commercial circles that railroad expenditures were "good" for business. As a rule there was no disposition to discriminate. Just so the railroads spent money, the influence was beneficial. The situation is fundamentally altered by the transportation act. The rest of the country may make a 10 per cent profit on railroad expenditures for improvements, but ever afterward it must pay something like 6 per cent a year on the capital sum. The interest of the public, therefore, is that railroad investment should increase only as becomes absolutely necessary in the interest of efficiency and economy.

Metal Schedule of New Tariff Law

The full text of the metal schedule of the Fordney-McCumber tariff act, which became a law Thursday, Sept. 21, and was published in THE IRON AGE of that day, has been reprinted in pamphlet form and copies will be sent free of charge to any subscribers who ask for them. The pamphlet gives also the duties in the two preceding tariff laws.

CORRESPONDENCE

What "Laboratories for Reseach in Facts" Mean to Industry

To the Editor: May I direct attention through the columns of THE IRON AGE to an admirable article in *Science* of Aug. 25, entitled, "The Record of Science"? This article is the address of William Warner Bishop, formerly chief of the reading room of the Library of Congress, before the Michigan Chapter of Sigma Chi. Mr. Bishop has taken for his text the statement that "Bibliography is the foundation of Research." No man could be better equipped to argue the case. The thought uppermost in his mind is that we are getting too far away from utilization of the records of science. We are depending too much upon observations made in the laboratory.

Facts seem to support Mr. Bishop, for we find that the National Research Council lists in its "Research Laboratories in Industrial Establishments (alone) in the United States" 526 firms operating laboratories for research. In *Science* for Jan. 13, 1922, on page 51, we find a summary of the publication issued by the National Research Council on funds invested in research. This summary indicates that there are available 565 separate funds for all kinds of research, from medicine to mathematics, representing an annual yield totaling over $22,000,000. Yet I venture to assert that not 50 per cent of the 526 industrial firms operating research laboratories maintain laboratories for research in facts or, to use Mr. Bishop's phraseology, research in the "book sciences."

The relative proportion spent on bibliography, or as

I choose to call it, research fact-oring, or searching for facts, is illustrated in a case I know of, where a large industrial organization invested over $400,000 in a research laboratory building and in the library included not one-tenth of that amount was expended in the original investment. Yet bibliography *is* the foundation of research.

And now let us look at the heart of the heart of the "workshop of the world." The Directory of Special Libraries, published in 1921, shows that in Pittsburgh there is no great laboratory for research factoring in iron and steel. Yet Mr. Carnegie has been reported to say that his firm wasted thousands of dollars because it did not find out what others had done first.

Pittsburgh is reported the center of the coal mining industry, yet we find no great laboratory of research factoring in coal mining.

The one bright spot in the workshop of the world is the unprecedented action of the Pittsburgh section of the American Chemical Society's library committee in raising a fund of over $2,000 which it turned over to the Technology Department of the Carnegie Library of Pittsburgh for the common good. Again the chemists are to the fore!

It is a little early yet, perhaps, to suggest to the hard-headed business man of this country that he should invest money in endowments for laboratories in research factoring and fellowships in "book sciences." But he might well begin to think about it. Even in Europe's unsettled condition we find that much attention is being given to the establishment of laboratories for research factoring.

In line with the above there appears in *Chemical News* (London), for Sept. 15, p. 153, the following statement: "Among the more specific problems which confront this board (a proposed board on regulation of research for the British Association for the Advancement of Science) are the following:

"1. The creation of research libraries where reference works can be consulted immediately.

"2. The provision of publication grants, so that where no periodical literature is available the work will not remain buried or obscure.

"3. The allocation of traveling grants to enable workers to visit libraries, to inspect manufacturing processes, and to attend the meetings of scientific societies."

These suggestions were brought forward by Principal J. C. Irvine in his address on "The Organization of Research." Evidently the British are going to make an attempt at building up the foundation of science, in other words, to build up bibliographic aids, which would seem to substantiate Mr. Bishop's assertion that "bibliography is the foundation of research."

K. C. WALKER,
Research Reference Assistant.
Bureau of Mines, Mining Experiment Station,
Pittsburgh, Sept. 27, 1922.

JAPANESE INQUIRIES INCREASE

Rails, Tin Plate and Locomotive Tires Included—German Quotations to Japan Low

NEW YORK, Oct. 3.—Although the situation in export trade shows no change, there is evidence of improvement in trade with Japan. At present trade is still largely confined to governmental and municipal buying, but inquiry from merchants is increasing. A request for prices on about 2000 tons of light gage black sheets was recently received by one Japanese house in New York, and although the business is not expected to materialize, this house reports booking some small orders, one of which was for about eighty tons of light gage black sheets. This exporter also received an order for about 600 tons of steel gas pipe of various specifications.

Bids are now being received from American mills on two good sized tin plate inquiries. One of these is from the Hokuyo, a large Japanese fishing organization with interests in the vicinity of Kamchatka and is being handled through a large Japanese export house which holds an interest in this organization. About 12,000 boxes of tin plate for canning is involved, but under present plans probably not more than 6000 boxes will be placed in the United States and the other half of the order will go to United Kingdom mills. Another tin plate inquiry from a Japanese oil company calls for 5000 boxes of oil can tin plate.

Among the Japanese railroad tenders is one from the municipality of Osaka, calling for bids on two miles of girder rails, one mile of 92-lb. and one mile of 102-lb. rails. The South Manchuria Railway Co., which has had a small order for about 700 tons of tie plates pending for some time, has placed it with the Mitsubishi Shoji Kaisha, 120 Broadway, New York and is now asking for bids on 250 locomotive tires. An inquiry for about 150 tons of structural steel for a bridge is pending from governmental sources.

German quotations on steel to Japan are still considerably below the best prices obtainable from British makers. On a recent inquiry from Japan for about 100 tons of ¾-in. to 3-in., mild steel bars, rounds, squares and flats, an exporter in New York received a bid of £11 14s 3d per ton, c and f. Japanese port from a British seller, and a price of £9 7s per ton, c and f. from a German house.

The Chinese market continues dull with the exception of the usual demand for wire shorts. According to the Bureau of Foreign and Domestic Commerce, the Sung Hang Railway Co., has been incorporated with capital stock of $600,000 (about $300,000 United States) for the purpose of constructing a narrow gage railroad from Sungkow, Kwangtung Province to Shanghang, Fukien Province, a distance of about fifty miles. One object of the railroad is to overcome the present necessity of transporting all cargoes from these districts across the Han River rapids and unnavigable parts of the river.

Twelve railroads, the total cost of which will be about £8,000,000 are under construction in Australia, says a report to the Bureau of Foreign and Domestic Commerce. In addition to these there are the city railroads and the Broken Hill line, the latter estimated to cost £1,277,440 completed. In addition to the twelve under construction five more railroad projects have been authorized but not begun. One of the largest projects under consideration is the Clarence River bridge to complete the North Coast Railway. Its cost is estimated at £500,000.

Early Improvement in Car Supply Not Expected

WASHINGTON, Oct. 3.—Complaints coming to the Federal Fuel Distributor from the iron and steel industry that large stocks have accumulated and are piling up on account of car shortages have met with the response that substantial relief probably will not develop for a month due to demands for the movement of coal under priority orders. It is believed that after this period and closing of the lake navigation season, the coal supply and transportation movement will be near normal and will make it possible to move steel stocks piled in mill yards and will result in increased production.

At the White House to-day it was announced that the President probably on Friday will name the fact finding commission to inquire into the coal situation. In as much as coal operators have declined the request of the President to select names outside of the industry, the commission will be selected without regard to the suggestions of the operators.

The Punxsutawney Furnace Co., Punxsutawney, Pa., is planning to light its furnace, which has been down for about 19 months, at an early date. The Adrian furnace, Dubois, Pa., is undergoing repairs and it is unlikely that the furnace will go into blast until after the first of the year.

GERMAN PRICE RISE HALTS

Temporary Cessation of Step-Like Increases in Iron and Steel

(*By Radiogram*)

BERLIN, GERMANY, Oct. 2. — Rising of prices has ceased temporarily. Foundry iron No. 1 is now 27,413 m. per metric ton. ($14.50 per gross ton, at 5⅝c. per 100 m.). Steel ingots are 34,370 m. ($18.18); steel bars, 46,930 m. (1.144c. per lb.); steel sheets 1 mm. (No. 19½ United States gage) thick, 69,750 m. (1.70c. per lb.).

[These prices replace 26,242 m. ($25.78) for foundry iron No. 1 on Sept. 18; 34,370 m. ($24.44) for ingots; 46,930 m. (1.49c. per lb.) for bars and 52,750 m. (1.675c. per lb.) for sheets exceeding 5 mm. (No. 6 United States gage), all figured at the exchange, 7c. per 100 m., then prevailing.]

Market conditions are continuing strong. The number of unemployed for all Germany has reached a new low record at 11,960, but officials predict a decline in activity.

Stocks of iron and steel corporations have undergone a new rise, the stock index average since Jan. 1 having risen from 229 to 429. The General Electric Corporation (Allgemeine Elektricitaets Gesellschaft) is raising its capital stock by 300,000,000 m. to 1,400,000,000 m.

Siemens-Schuckert interests have concluded a contract with the Soviet Central Electrical Board to supply large quantities of electrical goods on credit. Moscow *Izvestiya* says agents of Otto Wolff, Cologne, have arrived to propose a new scheme for the restoration of the Southern (Russian) steel works.

Otto Wolff, said to be the largest iron dealer in Germany and to control 80 per cent of the tin plate output of that country, has announced the formation of a far-reaching trust on the lines of the Stinnes electro-metal combination. In co-operation with Commercial Counselor Haniel he has combined the Phœnix Coal & Steel Co. with the Rhenish Steel Co. The Phœnix company already controls nine important concerns, including the Reisersteig shipyard at Hamburg; while the Rhenish Steel Co. controls five corporations, of which the largest is the Arensberg Smelting Co., Essen. These sixteen corporations constitute the metal wing of the new combination.

An electric wing and a shipping wing are included also. The electric group is made up of the Dessauer Co., which controls thirteen electric and gas concerns, and the Schorch plant at Rheydt, in Westphalia. Schorch already has effected an alliance with Saxony's largest electric concern. The shipping group consists of the Argus, the Roland and the North German Lloyd lines.

It is estimated that the combined capital of this entire Wolff group is 3,000,000,000 m., of which 2,000,000,000 m. represents the companies other than shipping. The organization gathers strength financially from its backing by the florin capital of the Dutch Blast Furnace Corporation, which lately acquired a large block of Phœnix stock.

GERMAN RAPID PRICE CHANGES

Many Companies Quoting in Foreign Currency—Reparations in Goods Contract Explained

BERLIN, GERMANY, Sept. 11.—The contract which has been concluded by Hugo Stinnes and the Marquis de Lubersac for the reparation in goods may start a new era in the relations between France and Germany. It is doubtful whether deliveries could take place as swiftly as expected, as the scarcity of building materials is acute in Germany. Production at cement, brick and lime works is hampered considerably by the scarcity of fuel. It is a noteworthy feature of the agreement that a certain amount of reparations coal is to be retained by Germany for the production of the materials which are to be supplied. The works may thus be brought up to a higher rate of production with the additional supply of fuel.

Provided the details of the agreement can be satisfactorily arranged, the French people in the devastated area may at last see a reparation which is of advantage to them and German industry has a certain security against extensive unemployment in the crisis which is expected. The agreement is a private contract and the material delivered is to be paid for by the French customer with a check to the German producer which the German Government will send to the reparations committee. The direct demand for iron and steel products will probably not be great, and the heavy industry has shown little interest in the question of reparation in goods, but the contract concluded seems to be paving the way for similar agreements, and negotiations in the iron and steel and other industries are already reported.

The quotations for scrap iron and steel are at present about ten times the price at the beginning of the year, and are fluctuating between 18,500 to 20,000 m. for iron and steel and up to 30,000 m. for cast iron (machinery). The Metallotorg, the Russian metal trade office, has shipped 13,250 tons of scrap and an old ship of 5400 tons to Germany. Up to Aug. 15, the average daily shipments have been 500 to 650 tons, but it is intended to bring them up to about 1200 tons.

The scarcity of iron has been more pronounced lately. The supply of fuel to the works is still insufficient and production is also hampered considerably through the shortage of limestone. The import of foreign ore is decreasing because of the heavy decline in the mark. German ore is still considerably cheaper than imports in spite of the heavy increases which have taken place lately.

The Pig Iron Association has rationed supplies to customers in order to finish old contracts, and the rate of imports is being maintained. Luxemburg pig iron is quoted at about 200 fr. at the frontier. Of the present deliveries of the association about 15 per cent of the iron is imported. The demand for rolled material is undiminished. Bar iron and plates are in special demand. Business in heavy sheets is still quiet. Imports of material from the Saar districts and Lorraine have further increased. The demand for wires and tubes is brisk. Export duties have been increased 60 per cent despite protests of the industry.

Seeking a Currency for a Trading Basis

At the Leipzig autumn fair some firms were using their gold mark (pre-war) prices as a basis for calculation by multiplying that amount with a certain figure which they arrived at by dividing the present exchange value of the dollar by 4.20. As wages and other charges have not increased in the same proportion the prices thus obtained were too high. This practice and the demand by other firms for payment of home orders in foreign currency has added in no small degree to the unpopularity of the last autumn fair.

A recent meeting of the Federal Association of German Industry concluded that there would be no advantage in introducing a new kind of currency to which the amounts of all balance sheets, taxes, wages, etc., would have to be reduced. It was pointed out that it would be difficult to determine exactly the index numbers which were to be used in reducing the present inflated amounts to gold mark or index mark, and that the showing up of the real amount of the inflation and the paying of wages and salaries in gold marks would raise prices and would possibly lead to a further decrease in the present value of the mark.

Several industries are now quoting their prices

either altogether in foreign currency or, as this meets with considerable opposition by the customers, they are quoting in what is called "broken" currency. Part of the price especially for imported material is quoted in foreign currency, and the rest which is to constitute the German cost of production is quoted in marks. In some lines, Solingen hardware and cutlery for instance, the gold mark prices have caused a slackening of business.

The "Eisenwirtschaftsbund," while not prescribing actual payment for home deliveries in dollars, has adopted the system of fixing its prices once every ten days according to the dollar exchange, and not according to the home production cost in marks. This procedure is rapidly spreading; with the result of a dual currency, and the prospect of a favorable development as at close of the assignat and mandat system of the French Revolution.

The dollar has begun to play the rôle of the French hoarded gold and silver, and possibly foreshadows, as in France, an easy, automatic death for the paper currency by which bondholders and mere mark holders will lose, but trade and industry, as in France, will probably gain.

FRENCH MARKET IMPROVES

More Furnaces in Blast But Coke Difficulties Feared—Prices Firm and Mills Booked Ahead

PARIS, FRANCE, Sept. 14.—The situation is satisfactory, although inland demands, which are now covered for some time to come, are not as active as they were in August. Export sales, however, are still rather strong.

On the other hand, furnaces which feel anxious about future coke supplies, do not want to be bound too far ahead. The price of Ruhr metallurgical coke was raised Sept. 1 to 6,018 m. per ton at ovens, which, at to-day's rate of exchange is equivalent to about 54 fr. German freight rates have been increased fifty per cent. Therefore, any upward move of the mark would have a considerable effect on the delivered price of the coke supplied to French blast-furnaces. The September adjusted price of coke is 95 fr. at the Franco-German frontier.

Rumor of an agreement between French and German iron and coal interests for an exchange of French iron ore for German coke has been current recently, but so far there has been no official confirmation.

Iron Ore.—Production of the French mines is increasing and sales are now easier. Present prices of minette, at mines, per metric ton are: Thionville (average grade) 11.50 fr. to 12 fr.; Briey 14.50 fr. to 15 fr.

Pig Iron.—Production of pig-iron in July was 428,115 tons, against 415,752 tons in June. The production of steel was 368,666 metric tons in July and 2,413,170 metric tons for the first seven months of 1922.

On Aug. 1, 94 furnaces were in blast, 62 ready to blow in and 64 under construction or repair, compared with 91 in blast on July 1.

There is some export demand for basic pig-iron, but French ironworks absorb nearly the whole production and have very little to spare. In foundry iron, available supplies are now restricted and No. 3 chill cast foundry iron is firm at 220 fr. at Eastern producing works. A few small sales of pig-iron to the United States are being reported.

It is reported that the United States has made inquiries for large quantities of French hematite, low in phosphorus. The specification of low phosphorus may prove an obstacle to most French producers, as hematite currently used in France contains about 0.10 per cent phos.

Semi-finished Steel.—This market is firm, with a rising tendency, and delays of delivery up to three months' duration are sometimes asked for. Latest prices per metric ton at Lorraine works are as follows (basic steel): ingots, 310 fr.; blooms, 315 to 320; billets, 340 to 345; flat bars, 360 to 365.

A rise of 5 or 10 fr. on these prices is considered imminent.

Beams.—Although the season for beams is nearing its end, there is still good business. Delays of delivery are from 7 to 8 weeks.

Rails.—There is a rather good inland demand for rails and there have also been a few transactions for export. A concern in eastern France has sold a small quantity of mine rails, weighing less than 14 kg. (28 lb. per yard) at 410 fr. f.o.b. Antwerp.

Rolled Merchant Products.—Although the demand has slackened, mills have enough orders on hand to insure regular working for some time and, consequently, are not making any special effort to obtain new orders. Present base price at Eastern producing works is 440 to 455 fr. The price for large shapes is 425 fr. Delays in delivery are from 14 to 16 weeks for small and 10 to 12 weeks for large shapes.

Plates and Sheets.—Notwithstanding the lack of orders from ship yards, sheet mills are generally booked until November. The restarting of a few plants has increased the ouput and diminished delays of delivery, which are now from 8 to 10 weeks for light sheets, 4 to 6 weeks for medium and 4 weeks for heavy sheets. Base prices have so far not been changed, but it is possible that they may be raised at the next meeting of the Comptoir des Toles as Belgian prices for light sheets have just been increased by 25 fr.

Castings.—The improvement is being maintained and delays of delivery are increasing.

Scrap Higher at Detroit

DETROIT, Oct. 3.—Practically all grades of scrap materials in this district show advances as compared with prices a week ago. While the shortage of pig iron is reflected in these advances, the acute demand in other districts has worked to the disadvantage of local melters. It is presumed the Dodge lettings on 3000 tons of turnings, borings, flashings and hydraulic compressed for October delivery will go to Cleveland and Valley points as heretofore. Large tonnages of machinery cast and stove plate are going to the Chicago market despite the freight rate of $3.78 per gross ton on these materials. Production does not seem to have fallen off and producers report they have not experienced any shortage of equipment to make their scheduled deliveries. The following prices are on a gross ton basis, f.o.b. cars producers' yards, excepting stove plate, automobile and No. 1 machinery cast, which are quoted on a net ton basis:

Heavy melting steel	$16.00 to $16.50
Shoveling steel	15.50 to 16.50
No. 1 machinery cast	24.50 to 25.00
Cast borings	12.50 to 13.50
Automobile cast scrap	25.00 to 26.00
Stove plate	17.00 to 18.00
Hydraulic comp.	17.00 to 18.00

Proceedings of the eighth annual meeting of the International Association of Industrial Accident Boards and Commissions have been published in Bulletin No. 304 of the United States Bureau of Labor Statistics, in the series on workmen's insurance and compensation. It traces in a comprehensive way the progress of compensation legislation as discussed in the opening session on Sept. 19. Special stress was placed on administrative problems under state funds in this country. Among other subjects of special significance outlined in the report are: accident prevention, the rating of permanent disabilities, medical problems, methods of procedure in accident reporting, administrative troubles and whether compensation commissions should administer accident prevention and other labor laws.

Costello patent furnaces are to be installed by Tate-Jones & Co., Inc., in the eight mill plants which the Weirton Steel Co. is building at Weirton, W. Va. The equipment will cover pair furnaces, sheet furnaces and box annealing furnaces.

SEPTEMBER IRON OUTPUT

Gain Last Month 9205 Tons Per Day as Compared with August

Fifty-Two Furnaces Blown in and Six Blown Out or Banked

The expected upturn in the pig iron production of the country, following a settlement of the coal and railroad strikes, is distinctly evident from the returns of blast furnace production for the month of September. According to statistics collected almost entirely by telegraph, there was a net gain of 46 furnaces during September; 52 furnaces were blown in and 6 were blown out. During July and August there was a net loss of 48 furnaces. Therefore, at the beginning of October the industry has virtually retraced its steps so that the number of furnaces active on Oct. 1 was 190 as compared with 192 on July 1. The actual gain in daily output was 9205 tons per day in September over August.

The production of coke and anthracite pig iron for the 30 days in September amounted to 2,033,720 gross tons or 67,791 tons per day as compared with 1,816,170 tons or 58,586 tons per day in August, a 31-day month. This represents a gain of 217,550 tons over September, but because many of the furnaces which resumed operations in September came in near the end of the month, the October output will be more representative of the recovery of the industry than the record made in September.

The total number of furnaces in blast on Oct. 1 was 190 as compared with 144 on Sept. 1, with 172 on Aug. 1 and with only 69 on Aug. 1, 1921, the low point in last year's depression. The capacity of the 190 furnaces in blast on Oct. 1 is estimated at 77,500 tons per day, as compared with 54,645 tons per day for the 144 furnaces in blast on Sept. 1.

The manganese-iron alloy output for September also suffered a decline at 14,916 tons, which is the lowest since April. Of the September output 10,681 tons was ferromanganese and 4235 tons was spiegeleisen.

Daily Rate of Production

The daily rate of production of coke and anthracite pig iron by months, from September, 1921, is as follows:

Daily Rate of Pig Iron Production by Months—Gross Tons

	Steel Works	Merchant	Total
September, 1921	27,189	5,661	32,850
October	33,365	6,850	40,215
November	37,960	9,223	47,183
December	41,173	12,023	53,196
January, 1922	42,130	10,933	53,063
February	46,827	11,387	58,214
March	53,547	12,128	65,675
April	56,930	12,140	69,070
May	60,619	13,790	74,409
June	62,534	16,167	78,701
July	62,295	15,297	77,592
August	45,672	12,914	58,586
September	53,856	13,935	67,791

The figures for daily average production, beginning with January, 1916, are as follows:

Daily Average Production of Coke and Anthracite Pig Iron in the United States by Months Since Jan. 1, 1916—Gross Tons

	1916	1917	1918	1919	1920	1921	1922
Jan.	102,746	101,643	77,799	106,525	97,264	77,945	53,063
Feb.	106,456	94,473	82,835	105,006	102,720	69,187	58,214
Mar.	107,667	104,882	103,648	99,685	108,900	51,468	65,675
Apr.	107,592	111,165	109,607	82,607	91,327	39,768	69,070
May	108,422	110,238	111,175	68,002	96,312	39,394	74,409
June	107,053	109,002	110,793	70,495	101,451	35,494	78,701
July	104,017	107,820	110,354	78,340	98,931	27,889	77,592
Aug.	103,346	104,772	109,341	88,496	101,529	30,780	58,586
Sept.	106,745	104,465	113,942	82,932	104,310	32,850	67,791
Oct.	113,189	106,550	112,482	60,115	106,212	40,215	.....
Nov.	110,394	106,859	111,802	79,745	97,830	47,183	.....
Dec.	102,537	92,997	110,762	84,944	87,222	53,196	.....

Among the furnaces blown in during September were the following: Three furnaces of the Lackawanna Steel Co., No. 2 furnace of the Donner Steel Co. and Buffalo A furnace of the Rogers, Brown & Co. in the Buffalo district; G furnace of the Bethlehem Steel Co. in the Lehigh Valley; two Worth furnaces of the Midvale Steel & Ordnance Co. in the Schuylkill Valley; three Eliza furnaces, two Aliquippa furnaces and the Soho furnace of the Jones & Laughlin Steel Co. and one Midland furnace of the Pittsburgh Crucible Steel Co. in the Pittsburgh district; four Johnstown furnaces of the Cambria Steel Co., the Colonial, Perry and Punxy furnaces in western Pennsylvania; one furnace of the Bethlehem Steel Co. in Maryland; one La Belle furnace in the Wheeling district; two furnaces of the Brier Hill Steel Co., three furnaces of the Republic Iron & Steel Co., one furnace of the Youngstown Sheet & Tube Co. and the Mattie and Trumbull-Cliffs furnaces in the Mahoning Valley; one furnace of the American Steel & Wire Co., one furnace of the National Tube Co., two Otis furnaces of the McKinney Steel Co., one Toledo furnace and the Dover furnace in central and northern Ohio; the Belfont and Milton furnace in southern Ohio; one Joliet furnace, three South Chicago furnaces of the Illinois Steel Co. in Illinois and four Gary furnaces in Indiana; Thomas furnace at Milwaukee; D furnace of the Colorado Fuel & Iron Co. in Colorado and one Detroit furnace of M. A. Hanna & Co. in Michigan; No. 1 Ensley furnace of the Tennessee Coal, Iron & Railroad Co. and one Allen's Creek furnace in Tennessee.

Production of Steel Companies—Gross Tons

Returns from all furnaces of the United States Steel Corporation and the various independent steel companies, as well as from merchant furnaces producing ferromanganese and spiegeleisen, show the following totals of steel making iron, month by month, together with ferromanganese and spiegeleisen. These last, while stated separately, are also included in the columns of "total production:"

Production of Steel Companies—Gross Tons

	Total Production			Spiegeleisen and Ferromanganese		
	1920	1921	1922	1920	1921	1922
Jan.	2,232,455	1,932,159	1,306,045	23,957	22,228	6,874
Feb.	2,181,679	1,625,695	1,311,170	28,038	29,013	8,540
Mar.	2,480,668	1,323,443	1,629,982	35,275	41,294	13,695
Apr.	1,968,542	1,015,621	1,707,902	27,628	24,310	19,209
May	2,128,720	1,024,678	1,879,180	33,407	9,232	20,334
June	2,209,770	883,312	1,876,033	34,751	4,536	23,090
July	2,230,567	715,664	1,931,138	36,789	5,524	26,049
Aug.	2,254,943	807,144	1,415,832	36,985	3,878	19,327
Sept.	2,247,250	815,692	1,615,696	39,546	3,289	14,916
Oct.	2,393,644	1,034,312	.....	34,786	3,902	.....
Nov.	2,150,075	1,138,789	.....	26,944	3,525	.....
Dec.	2,047,167	1,276,381	.....	28,023	3,953	.....

Among the furnaces blown out or banked during October are the following: The Robesonia furnace in the Lebanon Valley; one Ashland furnace in Kentucky; one furnace of the Wheeling Steel & Iron Co. in the Wheeling district; one furnace of the American Rolling Mill Co. in central Ohio; one South Chicago furnace of the Illinois Steel Co. in Illinois and one Ensley furnace of the Tennessee Coal, Iron & Railroad Co. and one Woodward furnace of the Woodward Iron Co. in Alabama.

Output by Districts

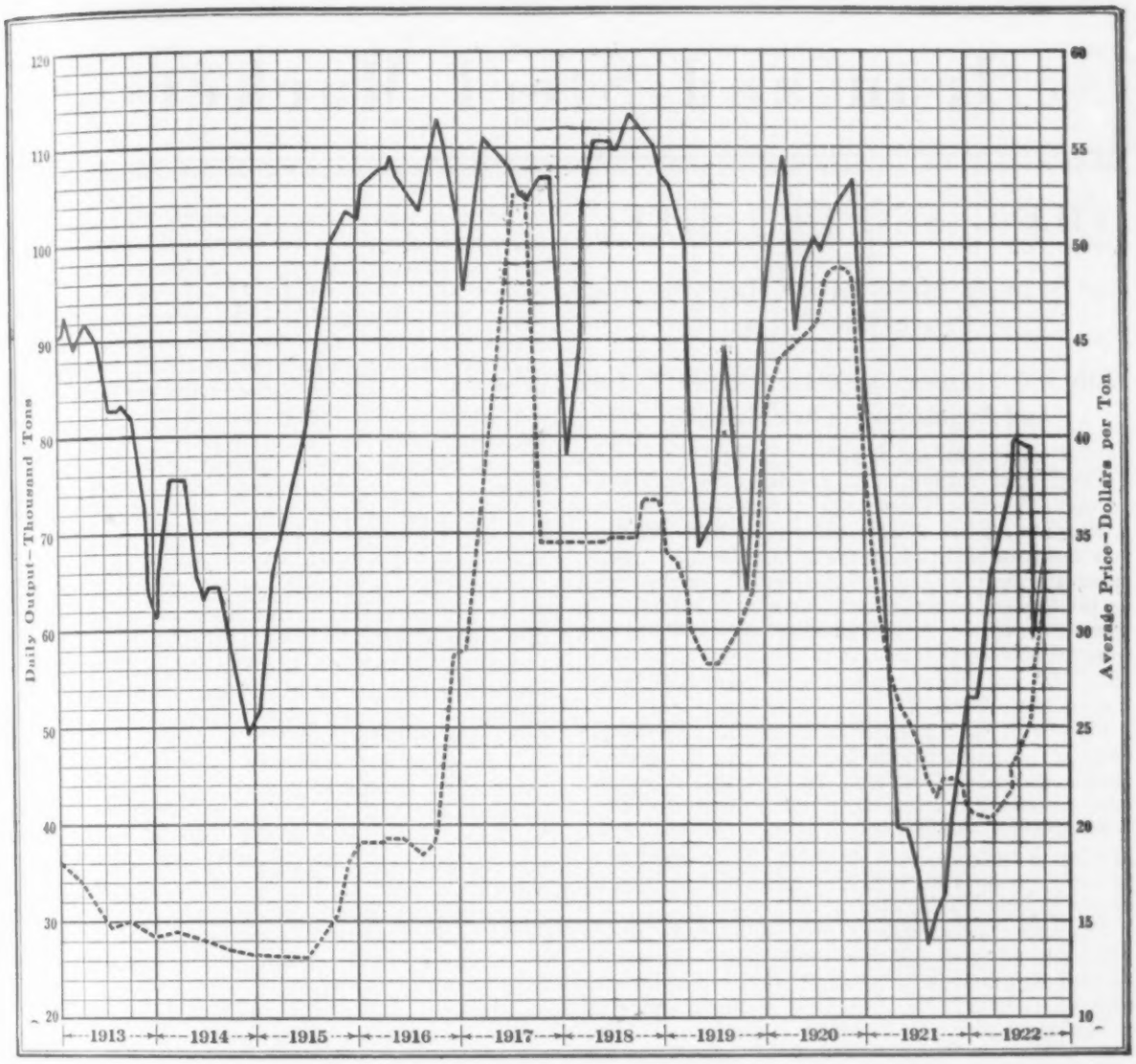
The accompanying table gives the production of all coke and anthracite furnaces for September and the three months preceding:

Pig Iron Production by Districts, Gross Tons

	Sept. (30 days)	August (31 days)	July (31 days)	June (30 days)
New York	115,635	80,322	145,831	148,115
New Jersey	10,736	11,604	10,475	10,725
Lehigh Valley	55,711	46,254	58,068	66,967
Schuylkill Valley	41,646	35,286	54,675	60,925
Lower Susquehanna and Lebanon Valleys	25,440	20,679	26,698	26,501
Pittsburgh district	502,804	432,178	493,963	485,401
Shenango Valley	63,841	58,812	99,335	87,156
Western Penna.	68,140	62,659	81,927	91,494
Maryland, Virginia and Kentucky	44,136	41,324	58,506	54,687
Wheeling district	43,366	57,752	65,753	74,710
Mahoning Valley	218,363	130,555	233,813	240,470
Central and Northern Ohio	184,914	191,880	261,084	236,374
Southern Ohio	17,909	15,305	29,517	30,272
Illinois and Indiana	346,380	342,363	472,371	454,937
Mich., Minn., Mo., Wis. and Colo.	67,656	67,265	101,656	93,723
Alabama	204,802	204,389	195,929	189,101
Tennessee	22,241	17,543	15,764	9,470
Total	2,033,720	1,816,170	2,405,365	2,361,028

Diagram of Pig Iron Production and Prices

The fluctuations in pig iron production from 1913 to the present time are shown in the accompanying



The Full Line Represents the Daily Production of Pig Iron and the Dotted Line Is the Average of the Price Per Ton of No. 2 Southern Pig Iron at Cincinnati, Local No. 2 Iron at Chicago and No. 2X Iron at Philadelphia

chart. The figures represented by the heavy lines are those of daily average production by months of coke and anthracite iron. The dotted curve on the chart represents monthly average prices of Southern No. 2 foundry pig iron at Cincinnati, local No. 2 foundry iron at furnaces in Chicago, and No. 2X at Philadelphia. They are based on the weekly quotations of THE IRON AGE.

Production of Coke and Anthracite Pig Iron in the United States by Months, Beginning Jan. 1, 1918—Gross Tons

	1918	1919	1920	1921	1922
Jan.	2,411,768	3,302,260	3,015,181	2,416,292	1,644,951
Feb.	2,319,299	2,940,168	2,978,879	1,937,257	1,629,991
Mar.	3,213,091	3,090,243	3,375,907	1,595,522	2,035,920
Apr.	3,288,211	2,478,218	2,739,797	1,193,041	2,072,114
May	3,446,412	2,108,056	2,985,682	1,221,221	2,306,679
June	3,323,791	2,114,863	3,043,540	1,064,833	2,361,028
½ year.	18,002,572	16,033,808	18,138,986	9,428,166	12,050,683
July	3,420,988	2,428,541	3,067,043	864,555	2,405,365
Aug.	3,389,585	2,743,388	3,147,402	954,193	1,816,170
Sept.	3,418,270	2,487,965	3,129,323	985,529	2,033,720
9 mos.	28,231,415	23,693,702	27,482,754	12,232,754	18,305,938
Oct.	3,486,941	1,863,558	3,292,597	1,246,676	.....
Nov.	3,354,074	2,392,350	2,934,908	1,415,481	.....
Dec.	3,433,617	2,633,268	2,703,855	1,649,086	.....
Tll. yr.	*38,506,047	30,582,878	36,414,114	16,543,686	.....

*These totals do not include charcoal pig iron. The 1921 production of this iron was 94,730 tons.

Officers of Steel Treating Society

DETROIT, Oct. 2.—The American Society for Steel Treating opened its 1922 convention in the General Motors Building Monday afternoon with an expected attendance of between 15,000 and 20,000 at the convention and exposition. The exhibits, which are unusually elaborate, occupy the greater portion of an entire floor and attracted a large attendance at the opening sessions.

Announcement was made at the initial meeting by the retiring president F. P. Gilligan of the result of the mail ballot for officers for the ensuing year, as follows:

President, T. D. Lynch, Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa.

First vice-president, R. J. Allen, metallurgist Rolls-Royce Co. of America, Springfield, Mass.

Second vice-president, W. S. Bidle, W. S. Bidle Co., Cleveland.

Treasurer, J. V. Emmons, metallurgist Cleveland Twist Drill Co., Cleveland.

Secretary, W. H. Eisenman, Cleveland.

Directors, S. M. Havens, Chicago; F. P. Gilligan, Henry Souther Engineering Co., Hartford, Conn.; J. J. Crowe, metallurgist Philadelphia Navy Yard, Philadelphia; A. E. White, department of engineering research, University of Michigan, Ann Arbor, Mich.

Iron and Steel Markets

PILING FINISHED STEEL

Car Scarcity More Acute, But Pig Iron Production Grows

With 190 Furnaces in Blast October 1, July and August Losses Are Made Up

Car shortages and the piling of finished steel at a number of rolling mills are featured in market reports from the Pittsburgh and Youngstown districts this week. A few shutdowns have resulted, and the possibility of others is mentioned. Specific cases are the piling of 100,000 tons of finished steel by the Carnegie Steel Co., a 10 per cent reduction in operations of the American Sheet & Tin Plate Co., considerable accumulations of stock at tube mills, and a 50 per cent shutdown at a sheet mill in the Youngstown district.

Much of this congestion is due to the 10-day embargo imposed by the Pennsylvania Railroad on shipments west of Altoona, and there is a promise of some relief, at least, when that embargo is lifted.

Coal supplies have ceased to be a limiting factor in steel production, and as most of the steel companies are equipped with by-product plants they are amply supplied with coke.

The production side of the industry, so far as pig iron and steel ingots are concerned, has shown further improvement, in spite of the shortage of cars at rolling mills, and blast furnace and steel works managers are evidently counting on being able to keep up the present rate of operations. In fact, there are plans for the early starting of several blast furnaces.

Recent indications that September blast furnace resumptions after the coal strike would nearly equal the suspensions of July and August have been borne out. On Oct. 1 furnaces in blast numbered 190, as against 144 on Sept. 1, 172 on Aug. 1 and 192 on July 1.

Pig iron output in the 30 days of September was 2,033,720 tons, or 67,791 tons a day, a sharp advance over the 1,816,170 tons in August, which was an average of 58,586 tons a day. The steel works furnaces made most of the gain, or 8200 tons a day, against 1000 tons a day gain for merchant furnaces, which brought them back practically to the rate of May.

The estimated capacity of the 190 furnaces active on Oct. 1 was 77,500 tons a day, against 54,645 tons a day for 144 furnaces on Sept. 1.

Railroads have furnished so much of the new business of the past fortnight that other buying is without significance. Every important line in the country and many small ones took on rails for 1923 before the $3 advance to $43 on Oct. 1, and the total of rail and track supply contracts is put at 1,500,000 tons.

Purchases of 5800 cars by five railroads have been uncovered in the week. Orders have been given for repairs to 2300 and fresh inquiries represent 11,800 cars. The Santa Fe has bought 59 locomotives.

Apart from the cutting off of a few peaks, prices of finished steel are quite well maintained. Sales above 2.25c. for plates are fewer and involve smaller lots than in early September. A few makers of lap-welded tubes have made a $4 advance and charcoal boiler tubes are up $10 a ton in some cases. Tie plates are higher at 2.35c. Pittsburgh, and angle bars have been sold as high as 2.75c. An advance of $3 a ton on painted barbed wire has been generally adopted. The sheet market has worked into easier prices in the Central West.

The blowing in of a number of merchant blast furnaces, the distribution of a round tonnage of pig iron made at Duluth to points in New England and New York, and somewhat easier conditions in the coke market have contributed to the sagging tendency of pig iron prices. A steel company in western Pennsylvania has been an active factor in selling at concessions. The largest transaction was the purchase of 16,000 tons of basic by an Eastern steel company. The recent buying of Alabama iron by soil pipe manufacturers amounted to 15,000 tons.

London reports that new buying of pig iron for the United States is falling off, but good sized amounts are still due for shipment.

Belgium has sold 50,000 tons of rails to Argentina and is negotiating with Brazil for 100,000 tons.

In pig iron, THE IRON AGE composite price fell in the week from $32.54 per gross ton to $32.11, the first recession since July 11. This compares with $19.93 a year ago.

Finished steel advanced from 2.433c. per lb. to 2.474c., a new high point on this movement, which compares with 2.236c. one year ago and is the highest since July 12, 1921.

Pittsburgh

Embargoes Seriously Interfere With Movement of Steel Products

PITTSBURGH, Oct. 3.—Car shortages and a very tight embargo set up by the Pennsylvania Railroad on shipments west of Altoona, Pa., extending from Oct. 2 until Oct. 11, already are beginning to take toll in the shape of plant suspensions. One Pittsburgh district strip maker has been forced to shut down as a result of conditions growing out of the railroad situation and a Youngstown sheet maker recently cut mill operations 50 per cent because its warehouse capacity became exhausted through inability to get cars for shipments. Operations of the American Sheet & Tin Plate Co. last week declined more than 10 per cent because of the transportation restrictions. Other companies are on the verge of curtailment or suspensions. The National Tube Co. and practically all other makers of pipe have been obliged to pile much of their production because of the car scarcity, while the Carnegie Steel Co. is said to have approximately 100,000 tons of steel piled up at its Monongahela River plant since cars are not available and the use of trucks has not made much of an impression on accumulations.

Coal supplies have ceased to be a factor in steel works operations, and as most of the steel companies are equipped with by-product plants, they are amply supplied with coke. The labor situation is not appreciably better, but the advent of cool weather is expected to bring men into the mills from outdoor occupations.

A Comparison of Prices

Advances Over the Previous Week in Heavy Type, Declines in Italics

At date, one week, one month, and one year previous

For Early Delivery

Pig Iron, Per Gross Ton:	Oct. 3, 1922	Sept. 26, 1922	Sept. 5, 1922	Oct. 4, 1921
No. 2X, Philadelphia‡	*33.11*	$34.26	$36.14	$21.84
No. 2, Valley furnace†	33.00	33.00	35.00	21.00
No. 2, Southern, Cin'ti†	31.05	31.05	29.05	23.50
No. 2, Birmingham, Ala.†	27.00	27.00	25.00	19.00
No. 2 foundry, Chicago**	32.00	32.00	32.00	21.00
Basic, del'd, eastern Pa	**29.50**	29.00	32.00	20.50
Basic, Valley furnace	*33.50*	34.00	30.00	19.25
Valley Bess., del. P'gh	35.77	35.77	34.77	21.96
Malleable, Chicago*	32.00	32.00	32.00	21.00
Malleable, Valley	*33.50*	34.00	33.00	20.50
Gray forge, Pittsburgh	34.27	34.27	34.76	21.96
L. S. charcoal, Chicago	36.15	36.15	36.15	31.50
Ferromanganese, seaboard*	67.50	*67.50	67.50	60.00

Rails, Billets, etc., Per Gross Ton:				
O.-h. rails, heavy, at mill	**$43.00**	$40.00	$40.00	$47.00
Bess. billets, Pittsburgh	40.00	40.00	38.00	29.00
O.-h. billets, Pittsburgh	40.00	40.00	38.00	29.00
O.-h. sheet bars, P'gh	40.00	40.00	40.00	32.00
Forging billets, base, P'gh	45.00	45.00	43.00	35.00
O.-h. billets, Phila	45.17	45.17	45.17	35.74
Wire rods, Pittsburgh	45.00	45.00	45.00	41.00
	Cents	Cents	Cents	Cents
Skelp, gr. steel, P'gh, lb.	2.00	2.00	2.00	1.60
Light rails at mill	2.25	2.25	2.00	1.75

Finished Iron and Steel, *Per Lb. to Large Buyers:*	Cents	Cents	Cents	Cents
Iron bars, Philadelphia	2.475	2.475	2.42	1.95
Iron bars, Chicago	**2.50**	2.25	2.25	1.75
Steel bars, Pittsburgh	2.00	2.00	2.00	1.60
Steel bars, Chicago	2.10	2.10	2.10	1.75
Steel bars, New York	2.44	2.44	2.34	1.98
Tank plates, Pittsburgh	2.25	2.25	2.00	1.60
Tank plates, Chicago	2.30	2.30	2.30	1.65
Tank plates, New York	2.49	2.49	2.34	1.98
Beams, Pittsburgh	2.00	2.00	2.00	1.60
Beams, Chicago	2.20	2.20	2.20	1.75
Beams, New York	2.44	2.44	2.34	1.98
Steel hoops, Pittsburgh	**2.90**	2.75	2.75	2.25

Sheets, Nails and Wire, *Per Lb. to Large Buyers:*	Oct. 3, 1922 Cents	Sept. 26, 1922 Cents	Sept. 5, 1922 Cents	Oct. 4, 1921 Cents
Sheets, black, No. 28, P'gh	**3.50**	3.35	3.35	3.00
Sheets, galv., No. 28, P'gh	**4.50**	4.35	4.35	4.00
Sheets, blue an'l'd, 9 & 10	**2.60**	2.50	2.50	2.25
Wire nails, Pittsburgh	2.70	2.70	2.60	2.90
Plain wire, Pittsburgh	2.45	2.45	2.35	2.60
Barbed wire, galv., P'gh	3.35	3.35	3.15	3.55
Tin plate, 100-lb. box, Pgh	$4.75	$4.75	$4.75	$5.25

Old Material, Per Gross Ton:				
Carwheels, Chicago	$24.50	$24.50	$22.50	$16.00
Carwheels, Philadelphia	23.00	23.00	20.00	17.00
Heavy steel scrap, P'gh	**22.00**	21.50	18.50	14.00
Heavy steel scrap, Phila.	**18.50**	18.00	15.50	11.75
Heavy steel scrap, Ch'go	18.50	18.50	17.50	12.25
No. 1 cast, Pittsburgh	24.00	24.00	19.00	17.50
No. 1 cast, Philadelphia	23.00	23.00	19.00	17.00
No. 1 cast, Ch'go (net ton)	21.00	21.00	21.50	13.50
No. 1 RR. wrot., Phila	**23.00**	22.00	18.50	15.50
No. 1 RR. wrot. Ch'go (net)	**18.25**	17.50	17.50	12.50

Coke, Connellsville, Per Net Ton at Oven:				
Furnace coke, prompt	$12.00	$12.00	$10.00	$3.25
Foundry coke, prompt	13.00	13.00	12.00	4.25

Metals, *Per Lb. to Large Buyers:*	Cents	Cents	Cents	Cents
Lake copper, New York	14.25	14.25	14.12½	12.62½
Electrolytic copper, refinery	13.75	13.75	13.75	12.37½
Zinc, St. Louis	*6.80*	6.87½	6.25	4.55
Zinc, New York	*7.15*	7.22½	6.60	5.05
Lead, St. Louis	**6.30**	6.25	5.55	4.50
Lead, New York	**6.65**	6.50	5.90	4.70
Tin (Straits), New York	**32.87½**	32.50	32.50	26.75
Antimony (Asiatic), N. Y.	6.75	6.75	5.37½	5.00

*C.i.f.

**The average switching charge for delivery to foundries in the Chicago district is 61c. per ton.

†Silicon, 1.75 to 2.25. ‡Silicon, 2.25 to 2.75.

The prices in the above table are for domestic delivery and do not necessarily apply to export business.

Composite Price, Oct. 3, 1922, Finished Steel, 2.474c. Per Lb.

Based on prices of steel bars, beams, tank plates, plain wire, open-hearth rails, black pipe and black sheets

These products constitute 88 per cent of the United States output of finished steel

Sept. 26, 1922,	2.433c.
Sept. 5, 1922,	2.412c.
Oct. 4, 1921,	2.236c.
10-year pre-war average,	1.609c.

Composite Price, Oct. 3, 1922, Pig Iron, $32.11 Per Gross Ton

Based on average basic and foundry irons, the basic being Valley quotation, the foundry an average of Chicago, Philadelphia and Birmingham

Sept. 26, 1922,	$32.54
Sept. 5, 1922,	30.52
Oct. 4, 1921,	19.93
10-year pre-war average,	15.72

Whether the situation will get easier, therefore, hinges largely on transportation conditions.

A somewhat remarkable condition, in view of the railroad situation, is the increase in blast furnace operations. In the past week the Jones & Laughlin Steel Co. started up its Soho furnace, which had been idle for about two years, bringing the number of active furnaces of that company to 10, out of a total of 12. The Pittsburgh Crucible Steel Co. has turned the blast on in one furnace and the Shenango Furnace Co. also has an additional stack in operation. Struthers furnace, Struthers, Ohio, will be lighted next Friday. By the end of the week there will be 80 active furnaces in this and nearby districts out of a total of 139, this comparing with 50, the low point in the last week of August, and 76 the previous peak point early in July. As soon as coke is available the Carnegie Steel Co. will start up one or two of its stacks at Farrell, Pa., and there will be resumptions by the Hanna Furnace Co. and the McKeefery Iron Co. at Leetonia, Ohio, the Reliance Coke & Furnace Co., Sharpsville, Pa., and the Kittanning Iron & Steel Mfg. Co., Kittanning, Pa.

The tendency of pig iron prices is lower as a result of the gain already registered in production. There is no appreciable weakening in steel prices; on the contrary, such changes as have taken place have been in the other direction. Hot rolled flats have advanced to the minimum of 2.90c. base, Pittsburgh, or $3 per ton above former quotations, while the American Sheet & Tin Plate Co. is out of the market for shipments for the remainder of this year, and this development establishes the independent prices as market minimums. Cold-rolled strips have advanced $5 per ton and charcoal iron boiler tubes $10 per ton. Independent makers of steel tubes have advanced prices $4 per ton and a change in the building method of leading pipe manufacturers, whereby the preferential and cash discounts are applied only to the f.o.b. Pittsburgh price, adds to the cost to buyers, especially at distant points. Under the lead of the American Steel & Wire Co. wire products have increased the extra for galvanizing nails $5 per ton, and prices of painted barbed wire have advanced $3 per ton.

Still higher prices have been established for scrap, but there is a feeling that this advance has about run its course for the present.

Pig Iron.—If there is a definite trend in prices in this market it is downward, chiefly because of the

activity of Cambria Steel Co. as a seller. That company recently sold 2000 tons of basic at $30, Johnstown, or more than $2 per ton delivered below what the iron could be bought for from Valley furnaces. The company now is quoting basic at $31, Johnstown; Bessemer $33, foundry $32.50 for the base grade, and malleable at $32.50. These prices all are well below the Valley furnace basis and the freight rate from Johnstown to Pittsburgh, common rate points, is $1.76 per ton, or practically the same as from the Valley. Valley furnaces, especially those depending upon Connellsville coke, cannot compete on costs with the Cambria company, and are not making much effort to do so. Actual business in this market lately has been very light. The largest sale was one of 1500 tons of basic at $33.50, Valley furnace, a decline of 50c. from the former quotation. Bessemer iron still is quotable at $34, Valley furnaces, on small sales. The range on foundry iron is extremely wide. Occasional sales have been made to melters whose requirements were specially pressing, at $35, but those more favorably situated in regard to supplies which could wait a few weeks for delivery have been able to buy as low as $33, Valley furnace. W. P. Snyder & Co. make the price of basic iron from Valley furnaces for September $32.93 against $25.41 in August, and Bessemer $33.50, against $28.67 in the previous month.

We quote Valley furnace, the freight rate for delivery to the Cleveland or Pittsburgh district being $1.76 per gross ton:

Basic		$33.50
Bessemer		34.00
Gray forge	$32.50 to	33.50
No. 2 foundry	33.00 to	35.00
No. 3 foundry	32.50 to	33.50
Malleable		33.50

Ferroalloys.—It is still impossible to quote domestic ferromanganese, as makers have not yet announced prices. Since consumers in this district are well covered against requirements for the remainder of the year at $67.50 or less, c.i.f. Atlantic seaboard, it is doubtful if domestic material could be sold at $101.10, Atlantic seaboard, the present price of British 80 per cent material plus the import duty. The uncertain supply of coke and its high cost also delay a price announcement, especially as American producers are believed to have in mind a price below the present delivered price of British material to secure control of the domestic market. The market has strengthened on 50 per cent ferrosilicon. Demand here is moderate, as most consumers covered their requirements for 1922 early in the year around $55 furnace, freight allowed. Only a few makers now are in production and they are quoting $65 to $70 furnace. A few carloads have been sold here at $65, Niagara Falls, the freight rate to Pittsburgh common rate points being $3.53.

We quote 78 to 82 per cent British ferromanganese, $67.50 c.i.f. Atlantic seaboard; domestic producers have not yet announced prices. Average 20 per cent spiegeleisen, $38 to $39 furnace; 16 to 19 per cent, $37 to $38; 50 per cent ferrosilicon, domestic, $65 furnace, freight allowed. Bessemer ferrosilicon is quoted f.o.b. Jackson and New Straitsville, Ohio, furnaces as follows: 10 per cent, $50.50; 11 per cent, $53.80; 12 per cent, $57.10; 13 per cent, $61.10; 14 per cent, $64.10; silvery iron, 6 per cent, $39; 7 per cent, $40; 8 per cent, $41.50; 9 per cent, $43.50; 10 per cent, $45.50; 11 per cent, $48.80; 12 per cent, $52.10. The present freight rate from Jackson and New Straitsville, Ohio, into the Pittsburgh district is $3.66 per gross ton.

Steel Skelp.—There is considerably less urgency to the demand now than there was a short time ago, due to the fact that several pipe makers, who ordinarily make their own skelp, but who recently were buyers, again are in production. We quote the market at from 2c. to 2.25c. except on small lots, which are urgent because of the delays to contract shipments on account of car shortages and railroad embargoes.

Wire Products.—Effective Sept. 27 the American Steel & Wire Co. increased the galvanizing extra on nails from $1.25 to $1.50 per 100-lb., on nails 1-in. and longer and from $1.75 to $2 on nails less than 1-in. in length. The company also has established a base of $3 on painted barbed wire and polished fence staples, an advance of $3 per ton. These changes have been adopted by leading independent manufacturers. Prices otherwise are unchanged. The leading interest is way behind in its deliveries and is accepting little or no new business even at the advanced prices recently named, since present obligations are believed to be equal to or in excess of probable production over the remainder of the year.

Iron and Steel Pipe.—Effective yesterday, leading manufacturers of pipe discontinued the practice of allowing the preferential and cash discount on delivered prices and hereafter such discounts are to be applied only on the f.o.b. Pittsburgh prices. This change applies to all classes of tubular goods, but involves no deviation from the custom of the absorption of freight by the producers. The total discount is reduced under the new method of billing to a simple net discount, from which the freight is deducted, and the discounts allowed on the value of the material at Pittsburgh. The change will mean a considerable addition to the price of pipe at points distant from Pittsburgh, but adds only slightly to the cost in the bigger centers of consumption.

Wire Rods.—Small sales for quick shipment still are being made by independent producers at $47.50, Pittsburgh, for the base size of common soft rods and some contract business also has been entered on the same basis, but it is subject to readjustment in the event that the market eventually crystallizes on a lower plane.

We quote No. 5 common basic or Bessemer rods to domestic consumers, $45 to $47.50; chain rods, $45 to $47.50; screw stock rods, $50 to $52.50; rivet and bolt rods and other rods of that character, $45 to $47.50; high carbon rods, $52 to $57.50, depending on carbon, per gross ton, f.o.b. Pittsburgh or Youngstown.

Billets, Sheet Bars and Slabs.—The market is holding firm at recent price levels, but this condition is due largely to the fact that car shortages are interfering with delivery rather than because production is insufficient. In general, sheet bars, slabs and 4-in. soft billets still are quotable at $40, Pittsburgh or Youngstown, that having been the base on the bulk of recent transactions. A premium of $2 to $2.50 on open hearth sheet bars is being asked over Bessemer bars by some makers and a little tonnage has been sold at $42.50, Pittsburgh. Steel works operations have not as yet suffered from transportation tangles, but all makers in this and nearby districts are piling considerable tonnage and with finished material accumulating to a point where there has been some curtailment of operations of finishing mills, early relief is necessary to prevent lighter steel works operation.

We quote 4 x 4-in. soft Bessemer and open-hearth billets, $40; 2 x 2-in. billets, $40 to $42; Bessemer sheet bars, $40; open-hearth sheet bars, $40 to $42.50; slabs, $40; forging billets, ordinary carbons, $45 to $47, all f.o.b. Pittsburgh or Youngstown mills.

Sheets.—The shortage of supplies has been intensified in the past week by an acute scarcity of cars, which has resulted in the piling of so much finished material as to threaten mill operations. One Youngstown independent has more than 10,000 tons of sheets stocked because of the lack of cars and has been obliged to cut mill operations 50 per cent. Non-integrated manufacturers have been forced to the use of trucks to get finished sheets to a point where cars were available and also in bringing sheet bars from producing plants to their mills. Demand is chiefly for early delivery, particularly on the part of the automotive industry, and prices are materially stronger for such service. One Youngstown independent recently announced prices of 2.75c. base, Pittsburgh, for blue annealed, 3.75c. base, for black and 4.75c. base for galvanized. Some of the independent makers are committed to take business at the Steel Corporation levels of 2.50c., 3.35c. and 4.35c., respectively, but as a general rule the independents are not going below 2.60c., 3.50c. and 4.50c. The leading interest is not yet ready to take on business for delivery after Jan. 1, and is so heavily committed as to be unable to take any business for shipment between now and that date. Minimum quotations given on page 897 are those of the American Sheet & Tin Plate Co., but refer only to deliveries on old orders. Independent makers of automobile sheets have increased the differential between body and other kinds of automobile sheets $3 per ton, now quoting body stock at 5c., base, for 22-gage and 5.25c., base, for fender, hood and cowl stock. The American Sheet & Tin Plate Co. prices are 4.70c. for body sheets and 4.80c. for fender, hood and cowl sheets.

Tin Plate.—There is a well-sustained and fairly active demand for tin plate in connection with dry food container requirements, but these demands are proving

no strain upon production. Shortage of box cars is hindering shipments, but not to the extent that premium prices can yet be obtained for definite deliveries. Concessions from the official price of $4.75 per base box, Pittsburgh, however, are infrequent, and if sheet bars hold at their present price of $40, it is likely that tin plate for first quarter of 1923 delivery will command at least $5 per base box.

Cold-Finished Steel Bars and Shafting.—An embargo established by the Pennsylvania Railroad to run from Oct. 2 to Oct. 11, on shipments west of Altoona, Pa., has added to the difficulties of a number of makers of cold-finished steel bars in getting supplies of hot-rolled bars and only a modification of the order or the granting of permits will prevent some of them from shutting down. Car shortages are interfering seriously with the movement of finished material from the mills in this district. The market is firm at 2.50c. base, Pittsburgh, for carload lots, while ground shafting also is unchanged at 2.90c. base, f.o.b. mills for carload,.

Hot-Rolled Flats.—There has been a further strengthening of the price with all of the independent makers now quoting a minimum of 2.90c. base, Pittsburgh, and from that up to 3.25c. for narrow, light material. No announcement yet has been made by the Steel Corporation, but it is so heavily obligated as to be a negligible factor as far as current demands are concerned.

Cold-Rolled Strips.—The market has gone to a minimum of 4.50c. base, Pittsburgh, since last reports, in keeping with the advancing hot-rolled material.

Bolts and Nuts.—Leading makers here have announced advances of from 5 to 10 per cent over the prices established early last month, with the average advance nearer 10 per cent. Consumers and distributors were allowed to specify liberally at the old discounts. New discounts are given on page 897.

Rivets.—There has been no change in prices, but the market is extremely firm because of irregular deliveries of raw materials, which with hindrances to shipments, due to railroad transportation conditions, increased producing costs. Prices and discounts are given on page 897.

Iron and Steel Bars.—Shipments of steel bars are seriously restricted by railroad transportation conditions, and it has been necessary for consumers in this district to either provide their own cars or to employ motor trucks to get supplies.

We quote steel bars rolled from billets at 2c. to 2.25c.; reinforcing bars, rolled from billets, 2c. to 2.25c. base; rail steel reinforcing bars, 1.90c. to 2c.; refined iron bars, 2.60c. in carloads, f.o.b. mill, Pittsburgh.

Structural Material.—New inquiries coming to fabricating companies in this district are fewer than they have been and are usually for small tonnages. Since shipments of plain material are hindered by car shortages, the let-up in demand is welcomed, since it provides the shops a chance to catch up with their back obligations. The most important structural lettings lately closed have been at prices of less than 2c. for plain material, plus 10 per cent for fabrication. Plain material prices are given on page 897.

Track Fastenings.—No change is noted in spikes, except that makers representing most of the capacity uniformly are quoting small track and boat and barge spikes at $3.50, base, per 100 lb. On large spikes, one maker here is quoting $2.75, base, per 100 lb., but 2.85c. is the more common quotation. Tie plates have further advanced, now being at 2.35c. minimum. Angle bars are up to 2.75c. Prices are quoted on page 897.

Plates.—Sales at more than 2.25c. base, Pittsburgh, are fewer and involve smaller tonnages than was the case recently. Generally, 2.25c. is the top, and an Eastern maker is understood to have been naming 2.15c., Pittsburgh, against some recent inquiries.

Boiler Tubes.—Leading makers of charcoal iron tubes have reduced discounts five points on all sizes, this being the same as an advance of $10 per ton, effective Oct. 2. There has been no change in steel tubes by the leading interest, but most of the independents have cut the discount on lap welded tubes two points, the equivalent of an advance of $4 per ton. New discounts will be found on page 897.

Steel Rails.—Pennsylvania Railroad has placed orders for standard rails as stated elsewhere in this issue. Light rails are firm at 2.25c., base, and find a good sale, chiefly to coal mining companies. Light sections rolled from old rails command 2c.

We quote 25 to 45-lb. sections, rolled from new steel, 2.25c. base; rolled from old rails, 2c. base; standard rails, $43 per gross ton mill for Bessemer and open-hearth sections.

Coke and Coal.—There has been no special change in the coke situation since a week ago. Shortage of cars still is exacting heavy toll upon the production of beehive oven coke and with a considerable portion of the Connellsville district still affected by the miners' strike, the output of the region is small in comparison with potential capacity. The labor situation is not as restrictive a factor in production as is the lack of cars. Steel companies operating by-product plants have ample supplies of coal, but apparently have no coke over and above their own requirements, and cannot help the smaller producers of pig iron. Demand for beehive oven coke exceeds the supply and the market remains very firm on spot tonnages at the prices of a week ago, or $12 to $12.50 per net ton at oven on furnace and $13 to $14 for foundry grade. Congestion at the lake ports has reduced the demand for coal and the market is rather soft in consequence. Mine run steam coal now is quotable from $3.50 to $4.25 generally, but Panhandle coal of extra good quality is held as high as $4.50. Mine run by-product coal ranges from $4 to $4.50 at mine, and gas coal from $4.50 to $5.

Old Material.—Prices have swept still higher since a week ago, sales of heavy melting steel having been made at $23 at Butler, Pa., and in the Youngstown district, but the Butler buyer has since withdrawn from the market and there is considerable doubt that $23 now can be obtained in Youngstown. On the whole, there is a much more conservative feeling about prices than there was recently, and not a few of the trade here believe that the top has been reached for the present. It is pointed out that in the past when an advance has been based upon the demand of one or two consuming points a break has ensued as a result of the inability of the strongest markets to absorb all the tonnage reaching them. None of the Pittsburgh steel makers has yet paid more than $22.50 for heavy melting steel and it is claimed that some fairly recent purchases were made as low as $21.50. The market is stronger here on compressed sheet steel with sales noted at $19.50 to $20. The material of this grade offered by Westinghouse Electric & Mfg. Co. for shipment this month sold at $19.85, f.o.b. East Pittsburgh. The market also is looking up on blast furnace grades, as high as $18.50 recently having been paid by a Pittsburgh district steel company for short shoveling turnings. Bids closed today on about 21,000 net tons of scrap offered by Pennsylvania Railroad, Eastern region. Close to 4000 tons of relaying rails are offered in this list.

We quote for delivery to consumers' mills in the Pittsburgh and other districts taking the Pittsburgh freight rate as follows:

	Per Gross Ton	
Heavy melting steel	$22.00 to	$22.50
No. 1 cast, cupola size	24.00 to	25.00
Rails for rolling, Newark and Cambridge, Ohio; Cumberland, Md.; Huntington, W. Va.; Franklin and Williamsport, Pa.	22.00 to	22.50
Compressed sheet steel	19.50 to	20.00
Bundled sheet sides and ends	17.50 to	18.00
Railroad knuckles and couplers	24.00 to	24.50
Railroad coil and leaf springs	24.00 to	24.50
Low phosphorus standard bloom and billet ends	25.00 to	26.00
Low phosphorus, plates and other grades	24.00 to	25.00
Railroad malleable	21.00 to	22.00
Iron car axles	32.00 to	34.00
Locomotive axles, steel	26.00 to	27.00
Steel car axles	24.00 to	25.00
Cast iron wheels	24.50 to	25.00
Rolled steel wheels	24.00 to	24.50
Machine shop turnings	16.00 to	16.50
Heavy steel axle turnings	18.00 to	18.50
Short shoveling turnings	18.00 to	18.50
Cast iron borings	18.50 to	19.00
Heavy breakable cast	21.00 to	21.50
Stove plate	19.00 to	19.50
Sheet bar crop ends	24.00 to	25.00
No. 1 railroad wrought	19.00 to	19.50

Chicago

Heavy Buying by Railroads—Production Is Still Improving

CHICAGO, Oct. 3.—Total bookings of rails by local mills aggregate approximately 600,000 tons and accompanying orders for track supplies over 100,000 tons. With this heavy backlog added to commitments in plates, shapes, bars and sheets, which will carry them through the last quarter and probably into next year, local mills are in a very comfortable position. While it is true that new demands calling for early delivery of the common products just mentioned is not so pressing as some weeks ago, this is explained by the fact that local production has improved and users no longer find it so necessary to seek prompt material to tide them over. Considerable new business continues to develop, however, but much of it is for forward delivery. Car orders are resulting in further purchases of steel by car builders and railroads are seeking liberal tonnages of plates, shapes and bars for car repair work to be done by their own forces. Briefly, railroad buying is the dominant factor in the market.

Production continues to improve. The operations of the Illinois Steel Co. remain unchanged, but the Inland Steel Co. has blown in its third furnace, its steel output, however, remaining the same. The Thomas merchant furnace has gone in at Milwaukee and other merchant stacks may blow in before the end of the month. Better coal deliveries have enabled the by-product coke corporation to increase its operations at Chicago and Milwaukee materially. The local plant is expected to be producing at over 50 per cent of capacity by the end of the week.

While improvement is to be noted, transportation is still seriously hampering both production and shipments. Owing to the concentration of the movement of coal to the Northwest, coal cars are congested at Lake Erie ports with the result that Illinois and Indiana mines are able to operate only three and four days a week because of lack of equipment. Shipments of finished material from mills and blast furnaces are still backing up because of the limitations on the use of open top cars for other than coal traffic. One important local mill has been forced to pile 30,000 tons on this account. Shipments of iron and steel from the East are impeded by an embargo by the Pennsylvania system on all freight except perishable goods and coal. This embargo went into effect yesterday and will remain in force until Oct. 11. The seamen's strike which, it was feared, might interfere with ore shipments to local plants is apparently confined to deck hands and will not prevent the sailing of lake vessels.

Ferroalloys.—A sale of ferromanganese has been made to a local plant at the full price of $67.50 seaboard plus the duty of $33.60.

We quote 78 to 82 per cent ferromanganese, future, $75.06; prompt, $108.66, delivered; 50 per cent ferrosilicon, $55 delivered on contract and $65 prompt delivery; spiegeleisen, 18 to 22 per cent, $50, delivered.

Pig Iron.—The Thomas furnace at Milwaukee is producing malleable. The Inland Steel Co., which, at intervals has taken merchant iron business, has put in a third furnace. Better coke production will probably enable the leading merchant iron interests to add further capacity before the close of the month. Pig iron production is obviously improved, but car shortage is seriously interfering with shipments. Sellers having cars on track are having no difficulty in disposing of them, but forward buying is not so active. Inquiries of any size, in fact, are noticeably few. Shipments from the South are still very uncertain and buying from producers in that section is therefore restricted. Melters are more interested in getting delivery on the iron they have on contract than in placing new orders. A number of them, in fact, have sent representatives to the South to see what can be done to move their iron. Southern prices are not well defined and range from $27 to $30, base, Birmingham. Other irons remain unchanged as to price. A sale of a substantial tonnage of imported low phosphorus with a trace of copper was recently made at approximately $39.50 delivered, Chicago. This is the first tonnage of imported low phosphorous which has competed successfully with domestic material in this market this year.

Quotations on Northern foundry, high phosphorus malleable and basic irons are f.o.b. local furnace and do not include a switching charge of 61c. per ton. Other prices are for iron delivered at consumers' yards, or when so indicated, f.o.b. furnace other than local.

Lake Superior charcoal, averaging sil. 1.50, delivered at Chicago	$36.15
Northern coke, No. 1, sil. 2.25 to 2.75	33.00
Northern coke, foundry, No. 2, sil. 1.75 to 2.25	32.00
Northern high phos	32.00
Southern No. 2	$33.00 to 36.00
Malleable, not over 2.25 sil	32.00
Basic	32.00
Low phos., Valley furnace, sil. 1 to 2 per cent copper free	38.00
Silvery, sil. 8 per cent	46.29

Plates.—Specifications are heavy and the placing of 4000 freight cars during the week will bring further business to mills in this district. The price situation is unchanged. Plates can still be obtained for fairly early delivery at 2.30c., local mill.

The mill quotation is 2.10c. to 2.34c., Chicago. Jobbers quote 2.90c. for plates out of stock.

Cast Iron Pipe.—Prices have advanced to a minimum of $43, Birmingham, for 6-in. and above. Clawson, Mich., will open bids Oct. 4 on 268 tons of 6 and 8-in. Chicago takes bids on Oct. 10 on 730 tons of 8 to 12-in. Detroit will take tenders Oct. 11 on 90 tons of 30-in. Fort Atkinson, Wis., closes bids on the same date for 3000 ft. of 6 and 10-in. and 23 tons of special. Franklin County, Ohio, Commissioners have awarded 400 tons to the Pitt Construction Co., Pittsburgh, but this tonnage has not yet been placed with a maker.

We quote per net ton, f.o.b. Chicago, as follows: Water pipe, 4-in., $55.20 to $57.20; 6-in. and above, $51.20 to $53.20; class A and gas pipe, $3 extra.

Bars.—Demand for soft steel bars for early shipment is less active, but present commitments of local mills carry them through the rest of the year, with the probability that they will lap over into first quarter, and this backlog is steadily being augmented by further orders for forward delivery. While Eastern mills are selling material for early shipment at as high as 2.25c., Pittsburgh, there is an increasing unwillingness on the part of users to pay premium prices. Bar iron is quiet, but has advanced to 2.50c., Chicago. Hard steel bar mills are well booked ahead and one maker has advanced prices to 2.10c. with the likelihood that others will follow, because of rising raw material and labor costs.

Mill prices are: Mild steel bars, 2c. to 2.34c., Chicago; common bar iron, 2.50c., Chicago; rail steel, 2c. to 2.10c., Chicago mill.

Jobbers quote 2.80c. for steel bars out of warehouse. The warehouse quotation on cold-rolled steel bars and shafting is 3.80c. for rounds and 4.30c. for flats, squares and hexagons.

Jobbers quote hard and medium deformed steel bars at 2.50c. base; hoops, 3.90c.; bands, 3.55c.

Rails and Track Supplies.—Rail bookings by local mills aggregate approximately 600,000 tons. In the past, the railroads rarely bought track fastenings outside of angle bars with the rails. This time, however, nearly every rail contract was accompanied by orders for all the necessary track supplies, including angle bars, bolts and spikes, and tie plates. The tonnage of supplies bought totals close to 20 per cent of the rail tonnage, or about 120,000 tons. Both rails and angle bars advanced, effective Oct. 1. Iron tie plates have also gone up, the new quotation being $50, mill.

Standard Bessemer and open-hearth rails, $43; light rails rolled from new steel, 2.15c., f.o.b. makers' mills.

Standard railroad spikes, 2.85c. to 3c., mill; track bolts with square nuts, 3.85c. to 4c., mill; iron tie plates, 2.50c.; steel tie plates, 2.25c., f.o.b. mill; angle bars, 2.75c., f.o.b. mill.

Jobbers quote standard spikes out of warehouse at 3.50c. base and track bolts 4.50c. base.

Wire Products.—Specifications showed a marked spurt last week, reflecting the desire of buyers to get a maximum amount of material before their contracts at lower prices expired. While production is increasing, mills will probably continue to have difficulty in

taking care of their trade throughout the remainder of the year. Shortage of cars is interfering with both deliveries of raw material and shipments of finished products. Reports from agricultural sections are rather gloomy, but as yet demand for wire products has not been affected. Wire rods are firm at a minimum of $45. Sales at higher prices are being made; in fact, as high as $50, Pittsburgh, has been paid on 300 tons of high quality rods. For mill prices, finished iron and steel, f.o.b. Pittsburgh, see page 897.

We quote warehouse prices, f.o.b. Chicago: No. 9 and heavier black annealed wire and No. 9 and heavier bright basic wire, $3.20 per 100 lb.; common wire nails, $3.35 per 100 lb.; cement coated nails, $2.75 per keg.

Bolts and Nuts.—Buyers are contracting freely for fourth quarter requirements. In some quarters a further advance in prices is looked for and one or two makers are reported to have taken such action already. Ruling discounts are those on page 897 except that the basing point is Chicago instead of Pittsburgh.

Jobbers quote structural rivets, 3.50c.; boiler rivets, 3.60c.; machine bolts up to ⅞ x 4 in., 50 per cent off; larger sizes, 50 off; carriage bolts up to ⅞ x 6 in., 45 off; larger sizes, 45 off; hot pressed nuts, squares and hexagons, tapped, $2.75 off; blank nuts, $2.75 off; coach or lag screws, gimlet points, square heads, 55 per cent off; quantity extras are unchanged.

Sheets.—Local mills are booked through the quarter with the probability that their commitments will carry them over into next year. The mills of the leading interest have been forced to curtail operations materially because of lack of steel, a condition traceable no doubt to the car shortage.

Mill quotations are 3.35c. to 3.50c. for No. 28 black, 2.50c. to 2.60c. for No. 10 blue annealed and 4.35c. to 4.50c. for No. 28 galvanized, all being Pittsburgh prices, subject to a freight rate to Chicago of 34c. per 100 lb.

Jobbers quote f.o.b. Chicago, 4c. for blue annealed, 4.85c. for black and 5.85c. for galvanized.

Reinforcing Bars.—There is an unusual number of projects up for figures, some of them large ones, and bookings in the next week or two are expected to be heavy. A large portion of the jobs contracted for within the past week are under 100 tons, but the aggregate business put on the books of dealers has been large. The market remains unchanged at 2.50c., Chicago warehouse, and while an advance is looked for, price shading has not entirely disappeared. Mill production continues to increase, but deliveries show little improvement owing to the car shortage. Contracts awarded include:

Gillett (Wis.) High School building, 100 tons, to Olney J. Dean Co., Chicago.

D. L. Plummer Memorial Hospital, Wausau, Wis., 275 tons, to Olney J. Dean Co., Chicago.

Filtration plant, Bay City, Mich., 1300 tons, to Paul J. Kalman Co.

Illinois road work, 300 tons, to Paul J. Kalman Co.

Apartment building, Minneapolis, Minn., 450 tons, to Concrete Steel Co.

St. Scholastica Academy, Atchison, Kan., 500 tons, to Corrugated Bar Co.

Office building, Des Moines, Iowa, 300 tons, to Concrete Steel Co.

Keenan Hotel, Fort Wayne, Ind., 250 tons, to Concrete Steel Co.

Cash Quality Store Co., Jamestown, N. Y., 100 tons, to Corrugated Bar Co.

Pending business includes:

McDougall warehouse, Duluth, Minn., 900 tons.

Structural Material.—Building activity shows remarkable buoyancy, notwithstanding the approach of the winter season. Fabricating awards are fairly numerous, although most of them are for relatively small tonnages. To a large extent early delivery is asked on new projects, with the result that many shops are unable to quote. Local mills are booked practically full for the rest of the year, and while Eastern producers continue to sell for early shipment at as high as 2.25c., Pittsburgh, demand for premium steel is not nearly so active as some weeks ago.

The mill quotation on plain material is 2.10c. to 2.34c., Chicago. Jobbers quote 2.90c. for plain material out of warehouse.

Old Material.—Excepting for a few advances, prices remain stationary in a rather quiet market. A large steel mill has made a substantial purchase of heavy melting at $19 and an iron mill has bought rolling mill grades at advanced prices, but in general consumers are rather apathetic. Among the foundries, gray iron shops are notably inactive, but malleable plants have made some fair purchases. Country scrap is being offered more freely and railroad lists are growing more numerous. When the transportation situation clears up sufficiently to permit uninterrupted shipping, the problem of scrap supply will probably grow less acute. Railroad offerings include the Burlington, 3000 tons; the Chicago & Northwestern, 3200 tons, and the Pennsylvania Southwestern Region, 1500 tons.

We quote delivery in consumers' yards, Chicago and vicinity, all freight and transfer charges paid, as follows:

Per Gross Ton	
Iron rails	$25.00 to $25.50
Cast iron car wheels	24.50 to 25.00
Relaying rails	27.50 to 32.50
Rolled or forged steel car wheels	23.50 to 24.00
Rails for rolling	20.50 to 21.00
Steel rails, less than 3 ft	21.50 to 22.00
Heavy melting steel	18.50 to 19.00
Frogs, switches and guards cut apart	18.50 to 19.00
Shoveling steel	18.25 to 18.75
Drop forge flashings	12.50 to 13.00
Hydraulic compressed sheet	15.50 to 16.00
Axle turnings	16.00 to 16.50
Per Net Ton	
Iron angles and splice bars	23.00 to 23.50
Steel angle bars	19.00 to 19.50
Iron arch bars and transoms	22.50 to 23.00
Iron car axles	25.50 to 26.00
Steel car axles	19.50 to 20.00
No. 1 busheling	15.50 to 16.00
No. 2 busheling	10.50 to 11.00
Cut forge	17.50 to 18.00
Pipes and flues	12.50 to 13.00
No. 1 railroad wrought	18.25 to 18.75
No. 2 railroad wrought	17.50 to 18.00
Steel knuckles and couplers	20.50 to 21.00
Coil springs	21.50 to 22.00
No. 1 machinery cast	21.00 to 21.50
No. 1 railroad cast	19.50 to 20.00
Low phos. punchings	17.00 to 17.50
Locomotive tires, smooth	18.50 to 19.00
Machine shop turnings	11.00 to 11.50
Cast borings	13.00 to 13.50
Stove plate	17.50 to 18.00
Grate bars	17.50 to 18.00
Brake shoes	17.50 to 18.00
Railroad malleable	22.00 to 22.50
Agricultural malleable	22.00 to 22.50

FIRE CLAY BRICK HIGHER

Advance in Prices Becomes General—Very Little Buying Reported

PITTSBURGH, Oct. 2.—The increase of $3 per 1000 in fire clay brick announced by a few manufacturers about two weeks ago has been generally followed by others and the market now is quotable in practically all producing districts at $43 to $46 for high duty and $39 to $42 for moderate duty brick. In keeping with this change is an advance of 50c. per ton in ground fire clay. There has been no further change in silica brick nor in chrome brick, but because of the duty of $11.50 per ton in imported magnesite, brick from that material has been advanced $15 per ton to $75 per net ton at Baltimore and Chester, Pa.

The latest advance in fire clay brick finds its chief explanation in the fact that on account of the railroad situation operations of the brick plants are extremely irregular, and since organizations have to be maintained regardless of whether plants are running, costs are mounting with much rapidity. The new prices have not found a great deal of basis in sales, because most consumers had good-sized orders in at lower levels and naturally are specifying against such orders and not buying very freely. Such business as has been entered for fourth quarter delivery is believed to average about $40 per 1000, f.o.b. works. It is thought in some quarters that the stiff advance in magnesite brick will result in the substitution of chrome brick for open-hearth furnaces.

We quote per 1000 f.o.b. works:

Fire Clay	High Duty	Moderate Duty
Pennsylvania	$43.00 to $46.00	$39.00 to $42.00
Ohio	43.00 to 46.00	39.00 to 42.00
Kentucky	43.00 to 46.00	38.00 to 42.00
Illinois	43.00 to 45.00	40.00 to 42.00
Missouri	43.00 to 45.00	38.00 to 42.00
Ground fire clay, per net ton	7.50 to 8.50	
Silica Brick:		
Pennsylvania		45.00
Chicago		53.00
Birmingham		48.00
Ground silica clay, per net ton	9.00 to 10.00	
Magnesite Brick:		
Standard size, per net ton (f.o.b. Baltimore and Chester, Pa.)		75.00
Grain magnesite, per net ton (f.o.b. Baltimore and Chester, Pa.)		43.50
Chrome Brick:		
Standard size, per net ton		50.00

New York

All Shipments of Coal to Great Lakes Region Stopped—Pig Iron Prices Sagging

NEW YORK, Oct. 3.—Owing to the congestion of cars at lower lake ports, all shipments of coal to the lake region have been stopped and prices of steam coal have declined to $3.25, compared with $4.25 last week and $2 at the time the coal miners' strike was declared April 1. Five thousand cars of coal are loaded and are being held at lower lake ports. The releasing of a large tonnage of coal which would have been shipped to the lakes will undoubtedly result in further reductions of prices and a more ample supply to iron and steel industries. All coke prices may be affected later, but are still firm at $14 to $14.50, Connellsville ovens, for foundry grades, while prices of furnace grades are easier, ranging all the way from $10 to $13. By-product coke is still quoted at $14, seaboard. Efforts to increase the supply of coke by importations have not been very successful, as the wastage is large, due to the difficulty of handling from boats to cars.

Pig Iron.—The market is dull and the downward trend of prices noted last week has continued. Although the usual quotations are based on $31, eastern Pennsylvania, for No. 2 plain sales of No. 2X iron at $31 and No. 1X iron at $31.50 are reported. Part of the tonnage recently shipped from Duluth to Buffalo has found its way into this district, having been sold on a basis of $31, Buffalo, but most of the Duluth iron was shipped to New England points. A pump company is in the market for 400 tons for fourth quarter. Most of the inquiry is for carload lots for immediate shipment. Foreign iron is coming in in small quantities at recent quotations. Continental iron is not meeting with much favor, owing to unsatisfactory analysis.

We quote delivered in the New York district as follows, having added to furnace prices $2.27 freight from eastern Pennsylvania, $4.91 from Buffalo and $5.44 from Virginia:

East. Pa. No. 1 fdy., sil. 2.75 to 3.25	$35.27
East. Pa. No. 2X fdy., sil. 2.25 to 2.75	34.27
East. Pa. No. 2 fdy., sil. 1.75 to 2.25	33.27
Buffalo, sil. 1.75 to 2.25	36.91
No. 2 Virginia, sil. 1.75 to 2.25	No sales

Ferroalloys.—Demand for ferromanganese is exceedingly light and quotations are unchanged for both the British and domestic products. Practically none of the latter is available and the quotation is nominal. A little business has been done in spiegeleisen at the prevailing quotation. Sales of small lots of 50 per cent ferrosilicon at $65 to $70, freight allowed, are also reported. Demand for ferrochromium is light, but specifications on contract for both ferrosilicon and ferrochromium are heavy. Quotations are as follows:

Ferromanganese, domestic, furnace, nominal, per ton	$100.00
Ferromanganese, British, c.i.f., per ton	$67.50
Spiegeleisen, 17 to 19 per cent, furnace	$38.00
Spiegeleisen, 20 per cent, furnace	$38.00 to $39.00
Ferrosilicon, 50 per cent, delivered, per gross ton, carloads	$65.00 to $70.00
Ferrosilicon, 10 to 15 per cent, delivered, per gross ton	$38.00 to $40.00
Ferrotungsten, per lb. of contained metal	50c.
Ferrochromium, 4 to 8 per cent carbon, 60 to 70 per cent Cr., per lb. Cr., delivered	14c.
Ferrovanadium, per lb. of contained vanadium	$3.50 to $4.00
Ferrocarbontitanium, 15 to 18 per cent, in carloads, per net ton	$200.00
Ores	
Manganese ore, foreign, per unit, c.i.f.	29c. to 30c.
Tungsten ore, per unit, in 60 per cent concentrates, nominal	$3.50 up
Chrome ore, basis 48 per cent Cr_2O_3, crude, per ton, Atlantic seaboard	$18.00 to $18.50
Molybdenum ore, 85 per cent concentrates, per lb. of MoS_2, New York	50c. to 55c.

Cast-Iron Pipe.—Municipal tenders have practically ceased for this year, but private buying still continues. Scarcity of 6-in. and smaller sizes is noted and most makers expect to continue full operation for the rest of the year at least. We quote per net ton, f.o.b. New York, in carload lots, as follows: 6-in. and larger, $54.50; 4-in. and 5-in., $59; 3-in., $64.80, with $4 additional for Class A and gas pipe. The cast-iron soil pipe market is active, warehouse stocks are low and some difficulty is being encountered in making shipments. We quote per net ton, delivered New York, discounts of both Southern and Northern makers, as follows: 2 to 6-in. standard, 25 to 30 per cent off list; heavy, 34 and 35 per cent off list.

Warehouse Business.—Activity continues, but there is difficulty in obtaining shipments from mills. It is felt in some quarters that the freight embargo may have a temporary effect of increasing prices on some materials. Most warehouses in this district report a continued improvement in business for September. Tire steel has been increased to 3.10c. per lb., base, and toe-calk is 4.15c. per lb. Blue annealed sheets are now fairly firm at 4.19c. per lb. for No. 10 gage, but black and galvanized still cover a wide range of quotations from 4.50c. and 5.50c. per lb., base, to 4.90c. and 5.90c. per lb., the latter quotations being those of the leading independent in this district and most warehouses. Dealers in iron and steel pipe report business active with a distinct scarcity of the smaller sizes of steel pipe. Brass sheets, rods and wire have been advanced by warehouses ¼c. per lb. and brazed and seamless brass tubes, ½c. per lb., because of the higher prices prevailing in the zinc market. We quote prices on page 916.

High Speed Steel.—The market is again dull in contrast to the slight activity that recently prevailed. While there is evidently a feeling that prices should be advanced, producers generally are quoting 18 per cent tungsten high speed steel at 75c. to 80c. per lb., base, with special brands of some companies bringing up to 90c. per lb.

Old Material.—The upward trend of prices continues, heavy melting steel being quoted at $14 to $14.50 per ton, based upon $18 per ton paid by the Bethlehem Steel Co. and the Alan Wood Iron & Steel Co. Cast iron pipe has been active, shipments going to Milton, Lebanon and Columbia, Pa. As high as $21.50 per ton, Pittsburgh, is said to have been paid in this district last week on a small tonnage stated to be the equivalent of railroad steel. Railroad steel is extremely scarce at present. The embargo of the Pennsylvania Railroad is causing some difficulty in making shipments. The Brooklyn Navy Yard, Brooklyn, will open bids, Oct. 6 on a small tonnage of scrap, both steel and cast iron.

Buying prices per gross ton, New York, follow:

Heavy melting steel, yard	$14.00 to $14.50
Steel rails, short lengths, or equivalent	15.00 to 15.50
Rails for rolling	15.75 to 16.25
Relaying rails, nominal	27.00 to 28.00
Steel car axles	17.00 to 18.00
Iron car axles	23.00 to 24.00
No. 1 railroad wrought	16.00 to 16.50
Wrought iron track	14.50 to 15.00
Forge fire	11.50 to 12.00
No. 1 yard wrought, long	14.00 to 14.50
Cast borings (clean)	12.50 to 13.00
Machine-shop turnings	11.50 to 12.00
Mixed borings and turnings	11.50 to 12.00
Iron and steel pipe (1 in. diam., not under 2 ft. long)	12.75 to 13.25
Stove plate	14.00 to 14.50
Locomotive grate bars	14.00 to 14.50
Malleable cast (railroad)	13.50 to 14.00
Cast-iron car wheels	14.50 to 15.00

Prices which dealers in New York and Brooklyn are quoting to local foundries, per gross ton, follow:

No. 1 machinery cast	$19.50 to $20.00
No. 1 heavy cast (columns, building materials, etc.), cupola size	17.00 to 17.50
No. 1 heavy cast, not cupola size	14.50 to 15.00
No. 2 cast (radiators, cast boilers, etc.)	13.00 to 13.50

Finished Iron and Steel.—Buyers seem to continue in the belief that they will gain something by waiting until present price readjustments have become established; hence the buying of steel products is on an extremely moderate scale, being just enough to satisfy current requirements, with little or no provision for the future. The prices which the subsidiaries of the Steel Corporation and the independents are quoting are drawing nearer together. The apparent tendency of the Steel Corporation mills is to stiffen their prices, while those independents which had obtained advances during the coal emergency are gradually working to lower levels. To-day, for example, the minimum on shapes and bars is 2c., Pittsburgh, while on plates nothing lower than 2.10c. is known to have been quoted. These are the minimum prices which recently have been in effect, and the former maximum prices are melting so there is a difference of only $2 or $3 a ton now between

the bottom and top. It is true that some mills still quote 2.25c., Pittsburgh, on plates, shapes and bars, but this price is taking little business. The bulk of current sales in the heavier products is going at not above 2.10c. and 2.15c., Pittsburgh. Rail orders have been the only business of large volume in the past week. The New York Central distributed orders for 194,300 tons and other roads have placed contracts for smaller quantities. Including the New York Central and the Pennsylvania tonnage, the latter being for 170,000 tons, probably 500,000 tons or more of rails has been bought by Eastern roads within the past week or ten days.

We quote for mill shipments, New York delivery, as follows: For indefinite delivery, soft steel bars, 2.34c.; structural shapes and steel plates, 2.44c.; for delivery in a number of weeks, soft steel bars and plain structural material, 2.44c. to 2.59c.; steel plates, 2.49c. to 2.59c.; bar iron, 2.49c. to 2.59c.

Boston

Sales of Foreign Iron Fall Off, But Those of Domestic Hold Their Own

BOSTON, Oct. 3.—Sales of foreign pig iron the past week dropped to comparatively small proportions, while those of domestic just about held their own. Aside from offers of eastern Pennsylvania No. 2X at $32, furnace, by interests heretofore asking $34, quotations show little change. Reports of Buffalo iron being offered elsewhere at concessions cannot be verified in this territory, active selling interests holding to former schedules. Continental irons are offered as low as $26.50, duty paid, but in such instances phosphorus and manganese analysis is out of line with standard grades. Sales of Buffalo and eastern Pennsylvania were confined to small tonnages, but a fair aggregate of Alabama spot and fourth quarter and of Virginia fourth quarter has been bought, largely for mixture with Scotch iron. A small tonnage of lake charcoal sold at $33 furnace base, or $41.19 delivered. New England foundries are busier, but are not back to normal. Most of them are believed to be well covered on iron requirements for at least two months. The largest general inquiry in the market is for 300 tons from a New Hampshire foundry. Approximately 4000 tons of Scotch iron arrived at this port in the week ending Sept. 30; 3350 tons for three local accounts and the rest for Philadelphia. The Connecticut Foundry Co., Rocky Hill, Conn., purchased 500 tons of No. 1 Scotch, delivery direct to its dock, all water route, for November. Effective Oct. 23, the Boston & Albany Railroad will equalize its freights from Boston to such points as North Adams, Springfield, Westfield, Winchendon and Worcester, Mass., with Boston & Maine rates. For instance, the Worcester rate, now $3.45, will be $1.80.

We quote delivered prices, on the basis of the latest reported sales, now infrequent, and as follows, having added to furnace prices $3.65 freight from eastern Pennsylvania, $4.91 from Buffalo, $5.92 from Virginia and $9.60 from Alabama:

East. Penn., sil. 2.25 to 2.75	$35.65 to $37.65
East. Penn., sil. 1.75 to 2.25	34.65 to 36.65
Buffalo, sil. 2.25 to 2.75	37.91 to 38.41
Buffalo, sil. 1.75 to 2.25	36.91 to 37.91
Alabama, sil. 2.25 to 2.75	38.10
Alabama, sil. 1.75 to 2.25	37.60
Virginia, sil. 2.25 to 2.75	38.92
Virginia, sil. 1.75 to 2.25	37.92

Warehouse Business.—Norway iron bars have been advanced 50c. per 100 lb. Otherwise no change in iron and steel quotations is reported. Sales from Boston stock for September will equal or better those for August, which was the best month experienced this year. Local stocks are in very good condition, due to recent shipments by mills. A further advance in wire nails is reported, this time 10c. per keg, making 25c. during the past fortnight and 40c. within a month. From store they are $3.70 per keg base. Galvanized nails also have advanced, in proportion with wire.

Jobbers quote: Soft steel bars, $3.25 per 100 lb. base; flats, $3.85; concrete bars, $3.25; structural steel, $3.25 to $3.50; tire steel, $4.50 to $4.85; open-hearth spring steel, $5 to $6.50; crucible spring steel, $12; steel bands, $4.25; hoop steel, $4.75; cold rolled steel, $4 to $4.50; refined iron, $3.25; best refined iron, $4.50; Wayne iron, $5.50; Norway iron, $6.50 to $7; plates, $3.35 to $3.55; No. 10 blue annealed sheets, $4.15 per 100 lb. base; No. 28 black sheets, $5.40; No. 28 galvanized sheets, $6.40.

Coke.—The New England Coal & Coke Co., Boston, and the Providence Gas Co., Providence, R. I., announce no change in their October by-product foundry coke prices, the contract quotation remaining at $16.50 delivered where the local freight does not exceed $3.10, and the spot at $19.50 delivered. Both oven interests report the fuel situation as much clearer. Some trouble is experienced in securing sufficient cars at the mines in which to ship coking coals north, but the movement as a whole is steadily expanding. Contract customers' foundry coke needs are supplied with little, if any, delay, and both the New England Coal & Coke Co. and the Providence Gas Co. will accept spot business. Competition from cokes made outside New England therefore is lessening. Connellsville fuel is offered at $14.50 ovens, which brings the New England delivered price far out of range with local cokes. In addition, sellers cannot guarantee deliveries due to the car supply situation. Alabama foundry coke is offered at $16.50 delivered, and English at practically the same basis, with bookings limited.

Finished Material.—Levering & Garrigues Co. will fabricate 960 tons of structural steel for the Edison Co.'s Boston power house extension, and the New England Structural Co. 175 tons for the Flattery building, Boston. The Boston & Maine Railroad has purchased 5700 kegs of heat-treated track bolts from an eastern Pennsylvania mill, and its 1923 angle bar requirements from the Rail Joint Co. Inquiries for plates hold up fairly well, but individual orders are small. Business in bars has dropped to small proportions, as most buyers are well covered for fourth quarter.

Old Material.—Further advances in prices for all old material have resulted from a continued heavy demand. Sales for the week run well up into the thousand tons. Early in the week round tonnages of heavy melting steel were taken for Pittsburgh district mill accounts at $15 and $15.50 shipping point. The last few days have witnessed a stiffening in the market, the top price paid being $16.50, f.o.b. Cambridge, Mass., for Butler, Pa., shipment. Buying of skeleton for eastern Pennsylvania forge fire and other interests lifted prices $1, while urgent inquiries from eastern Pennsylvania and Connecticut for chemical borings brought prices $1 to $2 higher. Specification pipe is moving freely at an advance of 50c., and dealers have bought large tonnages of railroad wrought at $16 and $17 for eastern Pennsylvania rolling mills. Seven cars of cotton ties brought $9.60, shipping point. An unusual sale was 100 gross tons of charcoal iron columns at $22.50, delivered Boston. Foundries are taking more machinery cast than heretofore, but are not much of a factor in the market. Round tonnages are going to New England industries, however, at prices $1 to $1.50 better than a week ago. A Hyde Park, Boston, manufacturer this week will sell 1000 tons of No. 2 cast.

The following prices are for gross ton lots delivered consuming points:

No. 1 machinery cast	$22.50 to $23.00
No. 2 machinery cast	21.50 to 22.00
Stove plate	17.50 to 18.00
Railroad malleable	19.00 to 19.50

The following prices are offered per gross ton lots f.o.b. Boston rate shipping points:

No. 1 heavy melting steel	$16.00 to $16.50
No. 1 railroad wrought	16.50 to 17.00
No. 1 yard wrought	14.50 to 15.00
Wrought pipe (1 in. in diam., over 2 ft. long)	12.00 to 12.50
Machine-shop turnings	10.50 to 12.00
Cast iron borings, rolling mill	14.00 to 15.00
Cast iron borings, chemical	17.00 to 17.50
Blast furnace borings and turnings	10.50 to 11.50
Forged scrap and bundled skeleton	11.50 to 12.00
Street car axles	23.00 to 24.00
Street car wheels	18.00 to 18.50
Shafting	18.00 to 19.50
Rails for rolling	16.50 to 17.00

The State Electricity Commission of Victoria, Australia, has invited tenders for the supply, delivery, etc., of a coal handling plant for the large Morwell electricity project. Copies of tender form, specification and drawings may be examined by American firms at the Bureau of Foreign and Domestic Commerce, Washington, or at its district offices in New York and Chicago and also at the office of the commissioner for Australia, Room 3012, 61 Broadway, New York.

Cleveland

Embargoes Delay Shipments and Some Mills Are Piling Steel

CLEVELAND, Oct. 3.—The car shortage has become very acute and an increased number of embargoes have added to the transportation difficulties. Some mills are piling steel and unless the situation improves operations will doubtless have to be curtailed. Some local consumers are trucking material from Pittsburgh district mills to points where they can secure cars. Locally pig iron is being trucked from furnaces to foundries because of the refusal of railroads to do the switching.

Iron Ore.—As was expected, ore shipments fell off sharply during September, being 6,801,299 gross tons, as compared with 9,016,426 tons during August. The movement for the year, until Oct. 1, was 33,111,238 tons as compared with a total movement last year of 22,300,726 tons. Shipments from Lake Erie docks are moving better than for several weeks, owing to the fact that the southern Ohio railroads are taking more ore than they have been recently. Other roads are handling ore promptly. A strike of lake seamen went into effect Oct. 1, but it is not expected that this will seriously interfere with the operation of boats.

Quotations below, except on basic and low phosphorus iron, are delivered Cleveland and for local iron include a 50c. switching charge. Ohio silvery and Southern iron prices are based on a $3.02 freight rate from Jackson and a $6 rate from Birmingham:

Basic, Valley furnace, nominal	$34.00
Northern No. 2 fdy., sil. 1.75 to 2.25	$34.50 to 35.50
Southern fdy., sil. 1.75 to 2.25	34.00 to 36.00
Malleable	34.50 to 35.50
Ohio silvery, sil. 8 per cent	44.52 to 45.52
Standard low phos., Valley furnace	38.00 to 39.00

Pig Iron.—The market has settled down to an unusually dull spell and locally there was not sufficient business during the week to clearly determine the price situation, which has developed a softening tendency. One additional merchant stack, Perry furnace in Erie, went in blast Sept. 29. With the competition of other furnaces that can market their product in Cleveland and vicinity, there are indications that the local price on foundry iron will settle down this week to approximately $34. While one local producer reports some lot sales during the week at $36, another has taken orders at $35 and probably will go at least $1 a ton lower to meet the price of outside iron that can be purchased at a Cleveland delivered price of around $34.50. One producer continues to quote foundry and malleable iron at $32 to $33.50 and reports sales of a few thousand tons in lots of 500 tons and under for delivery over the remainder of the year. Some producers have advanced Southern iron $2 to $30. We note the sale of one lot of 600 tons and another of 500 tons of Ohio silvery iron at $42.50 for the last quarter delivery. Low phosphorus iron is firm, carlot orders being taken as high as $39.

We quote delivered lower lake ports: Old range Bessemer, 55 per cent iron, $5.95; Old range non-Bessemer, 51½ per cent iron, $5.20; Mesabi Bessemer, 55 per cent iron, $5.70; Mesabi non-Bessemer, 51½ per cent iron, $5.05.

Alloy Steel.—The recent price advance on alloy steel did not hold, as quotations from ¼c. to ½c., a point below the schedule, are common. We quote 3½ per cent nickel steel at 5.25c. to 5.50c. Chrome nickel steel, 4.25c. to 4.50c., and chrome vanadium steel at 4.75c. to 5c. for spring steel and 5c. to 5.25c. for bars.

Water Pipe.—The City of Cleveland received alternative bids Oct. 2 for 10,400 ft. of 60-in. steel or cast iron pipe and also for 4280 ft. of 48-in. cast iron pipe. Martin & McDace and the Peter F. Connelly Co. were the low bidders.

Warehouse Business.—The leading sheet jobber who advanced prices last week $5 a ton on black and galvanized sheets has revised prices to a $2 a ton lower basis. Warehouse prices on wire have been advanced following the recent mill advance.

Semi-finished Steel.—The leading local producer has fixed $40, Youngstown, as the October price for sheet bars, billets and slabs for shipment to consumers with which it has contracts to make deliveries at the current market price during the month of September.

Finished Material.—While the chief concern of consumers now is to secure deliveries, a fair volume of new business is coming out. Prices show little change. Although on steel bars and structural material there is evidently not much business being placed above 2c., quotations range up to 2.25c. Plate quotations range from 2c. to 2.50c., with only small lot orders going above 2.25c. Lake shipyards are still figuring on boat inquiries and expect considerable repair work during the coming winter. The Virginian Railroad is inquiring for a coal-handling plant which will require 2000 tons of plates and shapes. Structural inquiries are light.

Jobbers quote steel bars, 2.91c.; plates and structural shapes, 3.01c.; No. 9 galvanized wire, 3.30c.; No. 9 annealed wire, 2.80c.; No. 28 black sheets, 4.40c.; No. 28 galvanized sheets, 5.40c.; No. 10 blue annealed sheets, 3.70c. to 3.76c.; hoops and bands, 3.71c.; cold-rolled rounds, 3.60c.; flats, squares and hexagons, 4.10c.

Sheets.—An easier price situation has developed in the sheet market. Mill stocks are being offered at 3.35c. for black and 4.35c. for galvanized. One mill that was quoting 2.70c. on blue annealed has reduced its price to 2.60c. On the other hand, one Valley producer has advanced its price $3 a ton. The demand for blue and galvanized sheets is fairly heavy, but black sheets are moving rather slowly.

Reinforcing Bars.—The demand for reinforcing bars continues heavy and prices are from 2c. to 2.10c. A large tonnage will be required for a warehouse for the Pillsbury Flour Mills Co. in Buffalo. Inquiries are also out for round lots for a Standard Oil Co. warehouse and a Board of Education warehouse in Cleveland and for 100 tons for a high school in Sharon, Pa.

Coke.—Pickands, Mather & Co. have arranged for a supply of by-product coke from the Youngstown district for their Perry furnace, which went in blast last week. The market on Connellsville foundry coke is very firm, with prices ranging from $14 to $14.50. Coke is available, but it is almost impossible to secure cars for shipment.

Bolts, Nuts and Rivets.—Leading bolt and nut manufacturers Monday made another advance in prices of from 5 to 10 per cent. Orders during the week on contracts expiring Oct. 1 were very heavy. The leading local rivet manufacturer Monday advanced prices $3 a ton for small lots of structural and boiler rivets, but is still quoting the old price of 3c. for the former and 3.10c. for the latter for round lots. Rivet orders continue heavy.

Old Material.—The market has continued its upward trend, although advances during the week were confined to heavy melting steel and a few of the other more active grades. Several Valley district mills made purchases of scrap during the week and most of the local transactions were for Valley shipment, although dealers bought some heavy melting steel for delivery to a Cleveland mill. For shipment to the Youngstown district, heavy melting steel has sold as high as $23 and compressed steel up to $20.

We quote per gross ton, f.o.b. Cleveland, as follows:

Heavy melting steel	$20.50 to $21.00
Steel rails under 3 ft	21.00 to 22.00
Steel rails, rerolling	24.00 to 25.00
Iron rails	18.00 to 18.50
Iron car axles	26.00 to 27.00
Low phosphorus melting	21.00 to 22.00
Cast borings	15.25 to 15.50
Machine shop turnings	14.50 to 14.75
Mixed borings and short turnings	15.00 to 15.50
Compressed steel	18.00 to 18.50
Railroad wrought	18.75 to 19.25
Railroad malleable	20.00 to 21.00
Light bundled sheet stampings	15.00 to 15.25
Steel axle turnings	16.00 to 16.50
No. 1 cast	21.00 to 22.00
No. 1 busheling	15.00 to 15.50
Drop forge flashings over 10 in.	14.50 to 15.00
Drop forge flashings under 10 in.	15.00 to 15.25
Railroad grate bars	17.00 to 18.00
Stove plate	17.00 to 18.00
Pipes and flues	14.50 to 14.75

St. Louis

Principal Inquiries Are for Basic from Distant Consuming Points

ST. LOUIS, Oct. 3.—There is still an active demand in this market for the higher silicon grades of pig iron. Buying has not been so brisk as in the previous week, because melters are inclined to buy only for immediate needs in view of the price of pig iron and the difficulties encountered in transporting it. A Sheffield maker has been shipping about 1500 tons weekly by barge to Metropolis and thence by rail to this territory. Most of this is on old orders, and this concern is taking on little new business. Very little is coming by all rail from the Birmingham centers because of the shortage of cars and congestion. There also is very little coming from the Chicago producing territory, largely because of the transportation situation. The Granite City maker is now working only on basic and all the foundry iron it has is of low silicon. It has inquiries involving from 5000 to 15,000 tons of basic from points outside of the district and normally served by other territories than this. Its sales during the week of low grade foundry iron totaled between 1000 and 1500 tons. The market remains at $32, Chicago, for Northern iron. For Southern iron, the price generally ranges from $28 to $29.50, Birmingham, but the Sheffield maker, whose barge and rail shipments are coming through promptly is quoting $30, freight added. Three inquiries have been received for a car each of ferromanganese in this district. The market is at $100 a ton f.o.b. seaboard, the advance on foreign and domestic material following the adoption of the new tariff.

We quote delivered consumers' yards, St. Louis, as follows, having added to furnace prices $2.16 freight from Chicago, $3.28 from Birmingham (rail and water), $5.17 from Birmingham, all rail, and 81 cents average switching charge from Granite City:

Northern foundry, sil. 1.75 to 2.25	$34.16
Northern malleable, sil. 1.75 to 2.25	34.16
Basic	34.16
Southern foundry, sil. 1.75 to 2.25 (rail and water)	33.28
Southern foundry, sil. 1.75 to 2.25, all rail	33.67 to 34.17

Finished Iron and Steel.—Chief interest in these lines among the trade here has been in the requirements of the railroads centering in St. Louis. Actual purchases of rails in the last two weeks have been about 43,000 tons. Here is the rail situation:

Missouri, Kansas & Texas: Purchased 10,000 tons.

Missouri Pacific: Purchased 15,000 tons.

Wabash: Purchased 15,000 tons.

Terminal Railway Association: Purchased 3000 tons.

Cotton Belt: 1920 purchase of 5000 tons and 1921 purchase of 15,000 tons not delivered. Question of purchase of 5000 additional tons will be taken up by new president after election to-morrow.

St. Louis & San Francisco: Requirements taken care of under contract.

All of the above 90-lb., except Terminal, which are 100-lb.

Other railroad inquiries follow:

Missouri, Kansas & Texas: 3000 net tons, high carbon, hot worked steel tie plates; 2000 kegs track bolts, 4500 kegs spikes.

Missouri Pacific: 3000 tons tie plates.

The contract for the structural steel in the new South Side High School, St. Louis, 600 tons, went to the Spuck Iron & Foundry Co., while the Reinforced Concrete Co., Chicago, got the contract for the bars (billet), 500 tons. Fabricators are becoming more interested in structural steel, and jobbers are buying bars more freely. The demand for nails is improving, one local jobber buying 1300 kegs of one size. Business generally is much better. An improvement is noted in deliveries.

For stock out of warehouse we quote: Soft steel bars, 2.90c. per lb.; iron bars, 2.90c.; structural shapes, 3c.; tank plates, 3c.; No. 10 blue annealed sheets, 4.10c.; No. 28 black sheets, cold rolled, one pass, 4.85c.; cold drawn rounds, shafting and screw stock, 3.90c.; structural rivets, 3.60c. per 100 lb.; boiler rivets, 3.70c.; tank rivets, ⅞ in. and smaller, 60 per cent off list; machine bolts, large, 50 and 10 per cent; smaller, 50-10 and 10 per cent; carriage bolts, large, 55-5 per cent; small, 60 and 10 per cent; lag screws, 60 per cent; hot pressed nuts, square or hexagon blank, $3.50; and tapped, $3.25 off list.

Coke.—The demand for coke continues far in excess of production. The local and Granite City by-product makers are still out of the market. The Granite City producer has increased its production of coke, as the coal supply has increased, but still is making no more than is required to take care of accumulated orders. The price is $14 at the oven. Connellsville coke has advanced to $14.50 per ton at the ovens, and a few shipments are coming through. Some Southern coke is being sold, but it has been found well-nigh impossible to get deliveries.

Old Material.—The market for old material continues strong, with a few items advancing. There is a good demand for rolling mill grades, such as couplers, knuckles, springs and car wheels. Melting steel is a little easier, but there is very little pressure on the market. The United Railways Co. sold 3000 tons of street car rails to dealers at fancy prices. The first railroad list of any consequence in some time was issued by the Pennsylvania, carrying about 3800 tons. The Burlington Railway issued a list, but withdrew it.

We quote dealers' prices f.o.b. consumers' works, St. Louis industrial district and dealers' yards, as follows:

	Per Gross Ton	
Old iron rails	$20.50 to	$21.00
Rails for rolling	20.75 to	21.25
Steel rails, less than 3 ft.	21.00 to	21.50
Relaying rails, standard section	26.00 to	29.00
Cast iron car wheels	24.00 to	25.00
No. 1 heavy railroad melting steel	17.50 to	18.00
No. 1 heavy shoveling steel	17.50 to	18.00
Ordinary shoveling steel	17.50 to	18.00
Frogs, switches and guards cut apart	20.50 to	21.00
	Per Net Ton	
Heavy axles and tire turnings	12.75 to	13.25
Steel angle bars	18.50 to	19.00
Iron car axles	26.00 to	26.50
Steel car axles	21.00 to	21.50
Wrought iron bars and transoms	22.00 to	22.50
No. 1 railroad wrought	17.50 to	18.00
No. 2 railroad wrought	17.00 to	17.50
Railroad springs	21.00 to	21.50
Steel couplers and knuckles	21.00 to	21.50
Cast iron borings	11.00 to	11.50
No. 1 busheling	13.50 to	14.00
No. 1 railroad cast	21.50 to	22.00
Railroad malleable	20.25 to	20.75
Machine shop turnings	9.50 to	10.00

Buffalo

Pig Iron Prices Soften—Marked Scarcity of Labor in Mills

BUFFALO, Oct. 3.—Pig iron prices have softened and the furnaces which have iron for sale are quoting $32 base, and though no sales at less than that figure have been reported, reports have been circulated that $31 is possible. Inquiry is quiet and less thon 4000 tons in scattered sales constitute the new business over the week. A sale of a small quantity of No. 2X at $34 shows consumers are willing to pay a slight bonus for the higher silicons. The American Locomotive Co. is understood to have bought iron, quantity not known, but will not melt it until next year. The Lackawanna mill of the Bethlehem Steel Corporation started its fifth furnace last week. This brings the total furnace operation in this district up to 13. All Lackawanna furnaces are producing basic iron.

We quote f.o.b. per gross ton Buffalo as follows, the higher prices being for early shipment:

No. 1 foundry, 2.75 to 3.25 sil.	$34.00
No. 2X foundry, 2.25 to 2.75 sil.	33.00
No. 2 plain, 1.75 to 2.25 sil.	32.00
Basic	34.00
Malleable	32.00
Lake Superior charcoal	36.28

Warehouse Business.—Bar demand for heavy sizes for use in car repairing and new cars and reinforcing bars to close up structural jobs before the advent of frost feature the warehouse market. All materials are in good demand with particular reference to blue annealed and galvanized sheets. New prices follow.

Finished Iron and Steel.—Prices are more stabilized than in many weeks, and demand for all products continues heavy. Minimum prices for bars are 2c., with shape prices 2c. to 2.10c., and plates 2.10c. to 2.25c. The labor shortage is becoming more serious and is having a direful effect on mill operations as against any other factor now existent. A free labor market

would bring full capacity operation in practically every steel interest in the Buffalo district. Wire business is especially brisk and a local seller is refusing new wire business on account of the labor difficulty, particularly in the shipping end. Cold rolled products are much sought and the 2.50c. price on carload lots rules. There is no change in the tin plate situation, the leading seller still declining to take 1923 business. Sheet business is brisk and the price of 3.50c. on No. 28-gage black base is uniform. A number of reinforcing bar contracts in the neighborhood of 100 tons average have been placed here, and the leading reinforcing bar maker is selling on a warehouse basis—2.50c., Pittsburgh. The Lackawanna mills of the Bethlehem Steel Corporation are operating at full capacity, 19 open-hearth furnaces going, rail and structural mills on single turn and plate, bar, blooming and billet mills on double turn.

We quote warehouse prices, Buffalo, as follows: Structural shapes, 3.20c.; plates, 3.20c.; soft steel bars, 3.10c.; hoops, 4.10c.; bands, 3.90c.; blue annealed sheets, No. 10 gage, 4.05c.; galvanized steel sheets, No. 28 gage, 5.85c.; black sheets, No. 28, 4.85c.; cold rolled round shafting, 3.95c.

Old Material.—A very active demand for all products and particularly for heavy melting steel has brought about another advance in prices and heavy melting steel is now quoted $19.50 to $20.50 here with the prospect of it going still higher because of better prices in the Youngstown district. About 7000 tons has been sold here in a week for delivery in Youngstown, the price on all sales being not less than $19.50. Dealers claim there will be a steadily increasing quantity of heavy melting steel moving toward Youngstown because of the reluctance of Buffalo district consumers to pay more than $18.50.

We quote dealers' asking prices per gross ton f.o.b. Buffalo as follows:

Heavy melting steel	$19.50 to $20.50
Low phos., 0.04 and under	21.00 to 22.00
No. 1 railroad wrought	19.00 to 20.00
Car wheels	21.00 to 22.00
Machine-shop turnings	14.50 to 15.50
Cast iron borings	17.50 to 18.00
Heavy axle turnings	17.50 to 18.50
Grate bars	16.00 to 17.00
No. 1 busheling	17.00 to 18.00
Stove plate	17.00 to 18.00
Bundled sheet stampings	14.00 to 15.00
No. 1 machinery cast	21.00 to 22.00
Hydraulic compressed	18.00 to 19.00
Railroad malleable	20.50 to 21.50

Birmingham

Soil Pipe Makers Buy 15,000 Tons at $27.50 —Other Transactions Light

BIRMINGHAM, ALA., Oct. 3.—September went out with the Birmingham pig iron market at $27 to $30. Soil pipe makers purchased an aggregate of 15,000 tons on a base of $27.50 for fourth quarter delivery. The lots ranged from 1000 to 5000 tons. An especially large and desirable tonnage could have been placed at $27 probably. Pressure pipe makers were making inquiries toward the end of the week, but did not specify tonnage, hence just what 20,000 tons would bring out in the way of concessions could not be judged. The largest foundry iron maker was on a base of $30 during the last week of the month and made a few sales at that figure, offerings being restricted to 500 tons. The usual sale was at $27.50 to $28, with two makers getting $28.50 for lots up to 200 tons. Lifting of embargoes to Cincinnati and Washington by the Southern Railway system at the close of the week suggested easier movements to consuming points in the immediate future. The Southern also moved a quantity of box cars into the district during the week and finishing mills reported a better supply. Stove and radiator plants have remained at full turn in spite of piling stock, but report ease in movement recently. Export steel and iron products movable down the Warrior River to Mobile have gone out in unusually large volume and this has also served to maintain production in several large plants. Outside of the soil pipe business the week's iron tonnage was not great, and makers seem to regard the market as losing none of its recent strength.

We quote per gross ton f.o.b. Birmingham district furnaces as follows:

Foundry, silicon 1.75 to 2.25	$27.00 to $28.00
Basic	27.00 to 28.00
Charcoal, warm blast	33.00 to 34.00

Finishing Mills.—The Tennessee company went back to a schedule of 9000 tons of rails per week at its Ensley mill this week, following several weeks of a 5000-ton turn due to the car situation. The tie plate mill went to 50 per cent greater capacity. The American Steel & Wire Co. is reported at 100 per cent, out of the market, and making heavy shipments to the Pacific Coast and for export. The Conners Steel Co. is still on cotton ties in one mill, with an unusual demand for this season of the year. The Gulf States Steel Co. is on full turn in finishing mills. The Southern Railway has ordered 40,000 tons of rails, mostly of 100-lb. section, of the Tennessee company for the first six months of 1923. The Chickasaw Shipbuilding & Car Co. is well cared for into next year, the Frisco system's order for 1000 steel hopper cars being among the latest bookings.

Coal and Coke.—Spot coke rules at $9 and $10. Callao, Peru, has taken another cargo of Alabama coal. Industrial coal production is making new high records.

Cast-Iron Pipe.—Pressure pipe was advanced Monday from $40 to $43 for 6 in. and upwards. All plants are on full or near full turn. Alexandria, La., will receive bids for 1600 tons this week and Memphis bids for 800 tons. Soil pipe is selling at from $60 to $65 with plants busy, but unfilled tonnage below recent levels. Car lots were sold to Mexico and Porto Rico.

Old Material.—The scrap market remains lively and quoted prices are regularly obtained both in Birmingham and adjacent districts. The tendency is to advance. Transactions are on a good scale.

We quote per gross ton f.o.b. Birmingham district yards as follows:

Steel rails	$16.00 to $17.00
No. 1 steel	14.00 to 16.00
No. 1 cast	18.00 to 20.00
Car wheels	18.00 to 20.00
Tramcar wheels	17.00 to 19.00
Stove plate	16.00 to 17.00
Cast-iron borings	9.00 to 10.00
Machine shop turnings	9.00 to 10.00

Cincinnati

Very Little Buying of Pig Iron—Southern Prices Show Wide Range

CINCINNATI, Oct. 3—Pig iron buying of the week has been of a hand to mouth character, sales and inquiries being for the most part light. The lifting of the embargo by the Southern Railroad, Sept. 30 is not expected to have an immediate effect on shipments of Southern iron as acute car shortage is a retarding factor. The outstanding sales reported was 1000 tons of charcoal iron for Michigan delivery. Among other sales were 350 tons of Southern iron and a 350- and a 400-ton lot of Northern iron. Two sales of Silvery iron were noted, 500 and 600 tons respectively, the reported price being $42.50. Inquiries current include 500 tons from a Toledo melter and 500 tons of malleable from a Northern Ohio melter. From the same district came an inquiry for 500 tons of low phosphorous iron. A first quarter inquiry from a central Ohio melter for 500 to 600 tons to Southern specifications is noted. Southern foundry iron is still quotable at from $27 to $30 base, Birmingham sales having been made at these and all prices between. The silicon differential generally quoted is $1, although at least one furnace still quotes 50c. an inquiry for 100 tons of Spiegelisen is noted, Southern Ohio foundry iron is variously quoted at from $32 to $34. The $32 iron is not a strictly foundry grade. A sale of 150 tons at $34 is noted.

Based on freight rates of $4.05 from Birmingham and $2.27 from Ironton, we quote f.o.b. Cincinnati:

Southern coke, sil. 1.75 to 2.25 (base)	$31.05 to $32.05
Southern coke, sil. 2.25 to 2.75 (No. 2 soft)	31.55 to 32.55
Ohio silvery (nominal), 8 per cent	43.77 to 44.77
Southern Ohio coke, sil. 1.75 to 2.25 (No. 2)	34.27 to 36.27
Basic Northern	34.77
Malleable	34.27 to 36.27

Finished Material.—The demand for finished materials is showing more life. Bars, particularly, are in good demand, and while 2c. can still be done, the majority of the orders being placed are taking a price of 2.15c. to 2.25c., where delivery is the most important factor. Shape prices are firming up, and the range is now 2c. to 2.25c., with orders for fairly early delivery bringing easily 2.10c. The minimum price quoted on plates by independent companies is 2.25c. against 2c., which is understood to be the price of the Steel Corporation. Several independent mills advanced prices on sheets for fourth quarter $1 a ton, but premiums as high as $5 per ton are being offered for prompt shipment. The new prices are 2.60c. for blue annealed, 3.65c. for black and 4.65c. for galvanized. The demand for wire products has shown much improvement during the past two weeks, and some fairly heavy orders have been placed at the new prices of $2.45 for plain wire and $2.70 per keg for wire nails. The Big Four Railroad is in the market for approximately 2500 tons of tie plates and 5000 kegs of track spikes, on which action will be taken early in the week. Should the makers quote favorable prices for next year's delivery it is reported that the road will place its full year's requirements, which would be in the neighborhood of 10,000 tons. Prices on tie plates are now $45 per ton, with $3 additional being quoted for copper bearing plates. On track spikes the lowest price obtainable appears to be $2.85 on lots of 1000 kegs or over. The Big Four inquiry calls for 1,250,000 bolts. On plates the quarter's requirements are estimated at 1500 tons, on shapes, 450 tons, and on iron bars, 650 tons. Bids will be opened on Oct. 5. There is little new activity in the structural field, the Big Four Railroad issuing the only inquiry of consequence, 200 tons for bridge work. A large number of reinforced buildings are about ready to break, which will involve substantial tonnages of bars. The only award of consequence was the steel work for the new plant of the J. A. Fay & Egan Co., Cincinnati, 800 tons having been awarded to L. Schreiber & Sons.

Warehouse Business.—Local warehouses continue to enjoy good business. Prices are showing considerable strength, and advances will likely be made on the heavier products within the next few days. Prices on wire products have been advanced $3 per ton, the new price on plain wire being $3 per 100 lb. and on wire nails $3.20 per keg.

Cincinnati jobbers quote: Iron and steel bars, 2.95c. base; reinforcing bars, 3.05c. base; hoops, 4.05c. base; bands, 3.85c. base; shapes and plates, 3.05c. base; cold-rolled rounds, 3.75c. base; cold-rolled flats, squares and hexagons, 4.25c. base; No. 10 blue annealed sheets, 4c.; No. 28 black sheets, 4.70c.; No. 28 galvanized sheets, 5.75c.; No. 9 annealed wire, $3 per 100 lb.; common wire nails, $3.20 per keg, base.

Coke.—A sale of 5000 tons of furnace coke was the leading activity of the week. While the market is quiet, prices are holding firm. Connellsville furnace coke is still at $12 and foundry coke is available from $13 to $14. New River foundry remains at $14 to $15, Wise County furnace coke is quoted at $11 and foundry $13, the same range prevailing on Pocahontas.

Old Material.—Fair activity continues in the scrap market, prices holding firm and in several items having advanced. There is some buying from steel mills and scrap for foundries is active.

We quote dealers' buying prices, f.o.b. cars Cincinnati:

Per Gross Ton	
Bundled sheets	$13.00 to 14.50
Iron rails	17.00 to 18.00
Relaying rails, 50 lb. and up	26.50 to 27.00
Rails for rolling	18.50 to 19.00
Heavy melting steel	17.50 to 18.50
Steel rails for melting	16.00 to 17.00
Car wheels	20.00 to 21.00
Per Net Ton	
No. 1 railroad wrought	14.50 to 15.00
Cast borings	11.50 to 12.00
Steel turnings	10.50 to 11.00
Railroad cast	18.00 to 19.00
No. 1 machinery	21.00 to 21.50
Burnt scrap	12.00 to 12.50
Iron axles	20.50 to 21.00
Locomotive tires (smooth inside)	14.50 to 15.50
Pipes and flues	9.00 to 9.50

Philadelphia

Railroad Freight Embargoes Now Having Serious Effect Upon Movement of Steel

PHILADELPHIA, Oct. 3.—The embargoes on freight movement on some of the railroads, excepting coal and foodstuffs, particularly the embargo on the Pennsylvania West of Altoona, are having a serious effect upon shipments of steel from the Pittsburgh and Youngstown mills to the East. The Pennsylvania embargo will be in effect for at least another week. Some mills are shipping via other roads when customers are willing to pay the difference in freight. Consumers in this district will doubtless become more dependent on Eastern mills for current requirements. There is no shortage of steel anywhere, but the situation is being watched closely by both buyers and sellers because of its possible effect on supply and prices.

Steel and pig iron business continues in moderate volume. There is little change in steel prices, but pig iron is weaker. Scrap continues to go up, but the advances are more moderate than those of a few weeks ago.

Pig Iron.—There is a fair volume of pig iron business, but it is mostly for early shipment, though some consumers are covering their probable requirements over the remainder of the year. Neither buyers nor sellers have taken any active interest in commitments for the first quarter of 1923. The largest buying of the week was in basic, an Eastern steel company taking an aggregate of 16,000 tons from three furnace companies. One furnace quoted $28, f.o.b. furnace, but the delivered prices on all of the iron bought ranged from $29.50 to $29.75. Foundry iron is being offered at about 50c. to $1 a ton below last week's prices. A fairly large tonnage for shipment to a point having a freight rate of more than $3 a ton was sold at $31, furnace, for No. 2X, but for nearby shipment the market ranges from $31 to $32 for No. 2 plain; $32 to $33 for No. 2X and about $1 a ton higher for No. 1X. Foreign iron is being offered very aggressively and at slight concessions in prices from those recently quoted. Receipts of foreign iron at the port of Philadelphia in the week ended Saturday, Sept. 30, were 7852 tons, of which 3150 tons came from England; 3468 tons from Belgium; 500 tons from Scotland and 734 tons from France. The Midvale Steel & Ordnance Co. blew in a second furnace at Coatesville last Thursday and has sold a substantial amount of basic and foundry grades. The Eastern Steel Co. is planning to put one of its furnaces in blast shortly. The Punxsatawney furnace went in blast last week.

The following quotations are, with the exception of those on low phosphorus iron, for delivery at Philadelphia and include freight rates varying from 76 cents to $1.64 per gross ton:

East. Pa. No. 2 plain, 1.75 to 2.25 sil.	$32.14 to $32.64
East. Pa. No. 2X, 2.25 to 2.75 sil.	33.14 to 33.64
East. Pa. No. 1X	34.14 to 34.64
Virginia No. 2 plain, 1.75 to 2.25 sil.	37.17
Virginia No. 2X, 2.25 to 2.75 sil.	38.17
Basic delivered eastern Pa.	29.50 to 29.75
Gray forge	31.00 to 32.00
Malleable	34.00 to 35.00
Standard low phos. (f.o.b. furnace)	38.00 to 40.00
Copper bearing low phos. (f.o.b. furnace)	37.00 to 38.00

Ore.—An Eastern steel company recently bought about 40,000 tons of Spanish steel-making ore at 8c. per unit, c.i.f. Atlantic port. Receipts of iron ore at the port of Philadelphia in the week ended Saturday, Sept. 30, included 7000 tons from French Africa; 7751 tons from Sweden and 386 tons from England. From Madras, British India, 1500 tons of chrome ore was received.

Coke.—The coke market has stiffened again, and blast furnace coke has been offered to Eastern furnaces within the past few days at $12.50 and $13, Connellsville.

Rails.—The Pennsylvania Railroad has distributed orders for 170,000 tons of 130-lb. rails as enumerated in another column. The Baltimore & Ohio has bought about 35,000 tons.

Semi-Finished Steel.—Open hearth rerolling billets are quoted from $40 to $42.50, Pittsburgh, and forging billets at $45 to $47.50, Pittsburgh.

Plates.—A good deal of the current plate business is going at prices ranging from 2.10c. to 2.25c., Pittsburgh, but 2.50c., Pittsburgh, has been received by one Eastern mill on a number of small orders aggregating about 1800 tons. The Baldwin Locomotive Works has placed orders for several thousand tons of plates for its recent locomotive contracts, this being the only large business done recently in this market. We quote the plate market from 2.10c. to 2.50c., Pittsburgh.

Structural Material.—Plain material is to be had from Eastern mills at 2.10c. and 2.15c., Pittsburgh, and a Pittsburgh mill is quoting 2c. Demand for new structural work is falling off, but a fair volume of business is being placed.

Bars.—Soft steel bars are quoted from 2c. to 2.25c., Pittsburgh, with only a moderate volume of business being placed. Bar iron is quoted from 2.15c. to 2.25c., Pittsburgh.

Sheets.—Most of the independent mills are asking 2.60c. to 2.75c. on blue annealed; 3.50c. to 3.75c. on black and 4.50c. to 4.75c on galvanized sheets, base, Pittsburgh.

Warehouse Business.—A further advance in warehouse prices has gone into effect, most of the prices named below being 10c. per 100 lb. or more above those of last week. We quote for local delivery as follows:

Soft steel bars and small shapes, 3.025c.; iron bars (except bands), 3.025c.; round edge iron, 3.20c.; round edge steel, iron finish, 1½ x ½ in., 3.20c.; round edge steel planished, 4c.; tank steel plates, ¼-in. and heavier, 3.125c.; tank steel plates, 3/16-in., 3.33c.; blue annealed steel sheets, No. 10 gage, 3.85c.; black sheets, No. 28 gage, 4.60c.; galvanized sheets, No. 28 gage, 5.75c.; square twisted and deformed steel bars, 3.15c.; structural shapes, 3.125c.; diamond pattern plates, ¼-in., 4.80c.; 3/16-in., 5c.; spring steel, 4.25c.; round cold-rolled steel, 3.85c.; squares and hexagons, cold-rolled steel, 4.35c.; steel hoops, No. 13 gage and lighter, 4.25c.; steel bands, No. 12 gage to 3/16-in., inclusive, 3.825c.; rails, 3.025c.; tool steel, 8.50c.; Norway iron, 6.50c.

Old Material.—Prices continue to move upward, but the advances are more moderate than those of a few weeks ago. There are several advances, ranging from 50c. to $1 a ton. Eastern mills are not buying heavily, but there is a steady demand from numerous sources.

We quote for delivery at consuming points in this district as follows:

No. 1 heavy melting steel	$18.50 to $19.00
Scrap rails	18.50 to 19.00
Steel rails for rolling	21.00 to 22.00
No. 1 low phos., heavy 0.04 and under	25.50 to 26.00
Cast iron car wheels	23.00 to 24.00
No. 1 railroad wrought	23.00 to 23.50
No. 1 yard wrought	20.00 to 21.00
No. 1 forge fire	17.00 to 17.50
Bundled sheets (for steel works)	17.00 to 17.50
No. 1 busheling	15.50 to 16.00
Turnings (short shoveling grade for blast furnace use)	17.00 to 17.50
Mixed borings and turnings (for blast furnace use)	15.00 to 15.50
Machine shop turnings (for steel works use)	17.00 to 17.50
Machine-shop turnings (for rolling mill use)	17.00 to 17.50
Heavy axle turnings (or equivalent)	17.00 to 17.50
Cast borings (for steel works and rolling mills)	16.50 to 17.50
Cast borings (for chemical plants)	23.00 to 25.00
No. 1 cast	23.00 to 24.00
Heavy breakable cast (for steel plants)	22.00 to 22.50
Railroad grate bars	17.00 to 17.50
Stove plate (for steel plant use)	17.50 to 18.00
Railroad malleable	15.50 to 16.50
Wrought iron and soft steel pipes and tubes (new specifications)	17.00 to 18.00
Shafting	25.00 to 28.00
Steel axles	30.00 to 31.00

Swedish Contract to Carry Bethlehem Ore

The Bethlehem Steel Corporation has renewed the contract it had before the war with Axel Brostrom & Son, of Gottenborg, Sweden, for the transportation of a portion of its Tofo iron ore shipments from Chile to the United States. For the carrying out of the contract the Gottenborg firm expects to have built for it at a Hamburg shipyard two ore carriers of 21,000 tons dead weight capacity. The vessels will be equipped with 6000-hp. Diesel engines.

FUEL PROBLEMS

American Iron and Steel Institute Will Consider How to Effect Economies

Problems connected with the fuel situation due to recent strikes in the anthracite and bituminous regions will form an important part of the program of the twenty-second general meeting of the American Iron and Steel Institute, which will be held at the Hotel Commodore, New York, Friday, Oct. 27. It is announced that discussion from the floor will follow the reading of the papers. After the opening address by the president, Elbert H. Gary, the following papers will be read:

"Modern Methods of Mining Coal"—H. Foster Bain, director Bureau of Mines, Washington.

"The Storage of Bituminous Coal"—H. H. Stook, professor of Mining Engineering, University of Illinois, Urbana, Ill.; J. V. Freeman, director Coal and Coke Research Laboratory, United States Steel Corporation, Joliet, Ill.

"The Present Status of the Electric Furnace in Refining Iron and Steel"—J. A. Mathews, president Crucible Steel Co. of America, New York.

"Economic Importance of the Power Plant in the Steel Industry"—E. F. Entwisle, assistant general manager Steelton plant, Bethlehem Steel Corporation, Steelton, Pa.

"The Steel Requirements of the Automotive Industry"—C. H. Wills, president C. H. Wills & Co., Marysville, Mich.

"Heating Furnaces for Blooms, Slabs and Billets"—W. P. Chandler, Jr., fuel and experimental engineer Carnegie Steel Co., Duquesne, Pa.

"Use of Liquid Fuel in Metallurgical Furnaces"—R. C. Helm, director Worcester research laboratory of the American Steel & Wire Co., Worcester, Mass.

"The Thermal Efficiency of the Open Hearth Furnace"—C. L. Kinney, Jr., superintendent No. 1 open-hearth department, South Chicago Works, Illinois Steel Co., South Chicago.; G. R. McDermott, fuel engineer South Chicago Works, Illinois Steel Co., South Chicago, Ill.

"Fluorspar and Its Uses"—G. H. Jones, president Hillside Fluorspar Mines, Chicago.

Industrial Electrical Heating Exhibit

Devices for the industrial utilization of electric heat, apparatus used in connection with electric vehicles and industrial control equipment will feature an exhibit of the General Electric Co. in the Electrical and Industrial Exposition, New York, Oct. 7 to 14. Among other things will be shown an automatically controlled electric furnace for heat treating metals, annealing glass, baking vitreous enamel, and similar operations performed at temperatures of from 1000 to 2000 deg. Fahr.; an electric rivet heater for heating rivets up to five in. long and 1½ in. in diameter, an oil tempering bath, a tool room muffle furnace, immersion units for heating liquids, air heaters for ovens, special cartridge heating units for localized heating, electrically heated glue pots, and electrically heated pots for melting sealing wax, battery compound and similar substances.

The representatives of the company who will be present at the exhibit will be K. B. Jones and C. A. Treber, New York office, Messrs. Barker, Baldwin and Clendennin, Lynn, Mass., and Mr. Hammon, Schenectady, N. Y.

A wood screw with a square socket in the head, instead of the usual diametrical groove, has been put on the market by the P. L. Robertson Mfg. Co., Ltd., Milton, Ontario. The screw driver is made to fit into the socket and the screw is regarded as particularly valuable for overhead work, such as in electric wiring, and for spaces which it would be particularly difficult to reach with an ordinary screw and driver.

Figures of the Department of Commerce show the August production of automobiles to have been 246,941 passenger cars and 24,064 trucks. Figures for the 8 months ended Aug. 31 show a total of 1,507,495 passenger cars and 159,907 trucks, a total of 1,667,402 automobiles.

Prices Finished Iron and Steel, f.o.b. Pittsburgh

Plates

Sheared, tank quality, base, per lb.....2.00c. to 2.50c.

Structural Material

Beams, channels, etc.....2.00c. to 2.25c.

Iron and Steel Bars

Soft steel bars, base, per lb.....2c. to 2.25c.
Refined iron bars, base, per lb.....2.60c.

Hot-Rolled Flats

Hoops, base, per lb.....2.90c. to 3.25c.
Bands, base, per lb.....2.90c. to 3.25c.
Strips, base, per lb.....2.90c. to 3.25c.
Cotton ties, per bundle of 45 lb.....$1.13

Cold-Finished Steels

Bars and shafting, base, per lb.....2.50c.
Strips, base, per lb.....4.50c.

Wire Products

Nails, base, per keg.....$2.70
Bright plain wire, base, per 100 lb..... 2.45
Annealed fence wire, base, per 100 lb..... 2.45
Galvanized wire, base, per 100 lb..... 2.95
Galvanized barbed, base, per 100 lb..... 3.35
Galvanized staples, base, per keg..... 3.35
Painted barbed wire, base, per 100 lb..... 3.00
Polished staples, base, per keg..... 3.00
Cement coated nails, base, per count keg..... 2.20
Woven fence, carloads (to jobbers).....70½ per cent off list
Woven fence, carloads (to retailers).....68 per cent off list

Bolts and Nuts

Machine bolts, small, rolled threads...60 and 5 per cent off list
Machine bolts, small, cut threads....50 and 10 per cent off list
Machine bolts, larger and longer....50 and 10 per cent off list
Carriage bolts, ⅜ x 6 in.:
Smaller and shorter, rolled threads, 50, 10 and 5 per cent off list
Cut threads .....50 per cent off list
Longer and larger sizes.....50 per cent off list
Lag bolts .....60 and 5 per cent off list
Plow bolts, Nos. 1, 2 and 3 heads....50 and 10 per cent off list
Other style heads.....20 per cent extra
Machine bolts, c.p.c. and t. nuts, ⅜ x 4 in.:
Smaller and shorter.....45 per cent off list
Larger and longer sizes.....45 per cent off list
Hot pressed square or hex. blank nuts.....$3.25 off list
Hot pressed nuts, tapped..... 3.25 off list
C.p.c. and t. sq. or hex. nuts, blank..... 3.25 off list
C.p.c. and t. sq. or hex. nuts, tapped..... 3.25 off list
Semi-finished hex. nuts:
9/16 in. and smaller, U. S. S....75, 10 and 5 per cent off list
⅝ in. and larger, U. S. S.....70, 10 and 2½ per cent off list
Small sizes, S. A. E.....80 and 5 per cent off list
S. A. E., ⅝ in. and larger.....75 and 5 per cent off list
Stove bolts in packages.....80 and 5 per cent off list
Stove bolts in bulk.....80, 5 and 2½ per cent off list
Tire bolts .....50, 10 and 10 per cent off list

Cap and Set Screws

Milled square and hex. head cap screws....75 per cent off list
Milled set screws.....75 per cent off list
Upset cap screws.....75 and 10 per cent off list
Upset set screws.....80 per cent off list

Rivets

Large structural and ship rivets, base, per 100 lb..$3.00 to $3.15
Large boiler rivets, base, per 100 lb..... 3.10 to 3.25
Small rivets .....65 to 65 and 5 per cent off list

Track Equipment

Spikes, 9/16 in. and larger, base, per 100 lb....$2.75 to $2.85
Spikes, ½ in. and smaller, base, per 100 lb..... 3.50
Spikes, boat and barge, base, per 100 lb..... 3.50
Track bolts, base, per 100 lb..... 3.85 to 4.50
Tie plates, per 100 lb..... 2.35 to 2.50
Angle bars, base, per 100 lb..... 2.75

Welded Pipe

Butt Weld

Steel			Iron		
Inches	Black	Galv.	Inches	Black	Galv.
⅛	51½	26	¼ to ⅜.....	+ 7	+33
¼ to ⅜.....	57	31½	½	26	8
½	62	48½	¾	32	17
¾	66	54½	1 to 1½.....	34	19
1 to 3.....	68	56½			

Lap Weld

2	61	49½	2	29	15
2½ to 6.....	65	53½	2½ to 6.....	32½	19
7 to 8.....	62	49½	7 to 12.....	30	17
9 to 12.....	61	48½			

Butt Weld, extra strong, plain ends

⅛	47½	31	⅛ to ⅜.....+15		+48
¼ to ⅜.....	53	36½	½	25	13
½	59	48½	¾	32	18
¾	64	53½	1 to 1½.....	34	20
1 to 1½.....	66	55½			
2 to 3.....	67	56½			

Lap Weld extra strong, plain ends

2	59	48½	2	30	17
2½ to 4.....	63	52½	2½ to 4.....	33	21
4½ to 6.....	62	51½	4½ to 6.....	32	20
7 to 8.....	58	45½	7 to 8.....	25	13
9 to 12.....	52	39½	9 to 12.....	20	8

To the large jobbing trade the above discounts are increased by one point, with supplementary discounts of 5 and 2½ per cent.

Boiler Tubes

Lap Welded Steel			*Charcoal Iron*	
1¾ in.	21½	to 23½	1½ in. .....+	7
2 to 2¼ in....	36	to 38	1¾ to 1⅞ in.....	3
2½ to 3 in.....	47	to 49	2 to 2¼ in.....	13
3¼ to 13 in....	52	to 54	2½ to 3 in.....	18
			3¼ to 4½ in.....	20

To large buyers of steel tubes a supplementary discount of 5 per cent is allowed.

Standard Commercial Seamless Boiler Tubes

Discounts on cold-drawn tubes in carload lots, f.o.b. Pittsburgh, follow:

1 in.	57	2½ and 2¾ in.....	40
1½ and 1½ in.....	49	3 in.	44
1¾ in.	33	3½ to 4 in.....	49
2 and 2¼ in.....	36	4½ in. and 5 in.....	41

Hot Rolled

3 in.	46	3¼ to 4 in.....	51

Less carloads, 4 points less. Add $8 per net ton for more than four gages heavier than standard. No extras for lengths up to and including 24 ft. Sizes smaller than 1 in. and lighter than standard gage to be sold at mechanical tube list and discount. Intermediate sizes and gages not listed take price of next larger outside diameter and heavier gage.

Seamless Mechanical Tubing

Carbon under 0.30, base, 85 per cent off list. Carbon 0.30 to 0.40, base, 83 per cent off list. Plus usual differentials and extras for cutting.

Seamless Locomotive and Superheater Tubes

	Cents per Ft.		Cents per Ft.
2-in. O.D. 12 gage.....13		2¼-in. O.D. 10 gage....17¾	
2-in. O.D. 11 gage.....14		3-in. O.D. 7 gage.....33	
2-in. O.D. 10 gage.....15		1½-in. O.D. 9 gage.....13	
2¼-in. O.D. 12 gage....15		5⅝-in. O.D. 9 gage.....51	
2¼-in. O.D. 11 gage....16		5½-in. O.D. 9 gage.....53	

Tin Plate

Standard cokes, per base box.....$4.75

Terne Plate

(Per package, 200-lb.)

8-lb. coating	$9.30	25-lb. coating I. C.....$14.25	
8-lb. coating I. C.....	9.60	30-lb. coating I. C.....	15.25
15-lb. coating I. C.....	11.80	35-lb. coating I. C.....	16.25
20-lb. coating I. C.....	13.00	40-lb. coating I. C.....	17.25

Sheets

Blue Annealed

Nos. 9 and 10 (base), per lb.....2.50c. to 2.75c.

Box Annealed, One Pass Cold Rolled

No. 28 (base), per lb.....3.35c. to 3.75c.

Galvanized

No. 28 (base), per lb.....4.35c. to 4.75c.

Tin-Mill Black Plate

No. 28 (base), per lb.....3.35c. to 3.50c.

Manufacturers have pamphlets, which can be had upon application, giving price differentials for gage and extras for length, width, shearing, etc.

Freight Rates

All rail freight rates from Pittsburgh on finished iron and steel products, in carload lots, to points named, per 100 lb., are as follows:

Philadelphia, domestic.	$0.325	Buffalo	$0.265	St. Louis	$0.43
Philadelphia, export...	0.235	Cleveland	0.215	Kansas City	0.735
Baltimore, domestic...	0.315	Cleveland, Youngstown		Kansas City (pipe)...	0.705
Baltimore, export.....	0.225	Comb.	0.19	St. Paul	0.595
New York, domestic...	0.34	Detroit	0.295	Omaha	0.735
New York, export.....	0.255	Cincinnati	0.295	Omaha (pipe)	0.705
Boston, domestic	0.365	Indianapolis	0.31	Denver	1.275
Boston, export	0.255	Chicago	0.34	Denver (pipe)	1.215

Pacific Coast $1.50	
Pac. Coast, ship plates 1.20	
Birmingham 0.69	
Memphis 0.385	
Jacksonville, all rail.. 0.50	
Jacksonville, rail and water 0.415	
New Orleans 0.515	

The minimum carload to most of the foregoing points is 36,000 lb. To Denver the minimum loading is 40,000 lb., while to the Pacific Coast on all iron and steel products, except structural material, the minimum is 80,000 lb. On the latter item the rate applies to a minimum of 50,000 lb., and there is an extra charge of 9c. per 100 lb. on carloads of a minimum of 40,000 lb. On shipments of wrought iron and steel pipe to Kansas City, St. Paul, Omaha and Denver the minimum carload is 46,000 lb. On iron and steel items not noted above the rates vary somewhat and are given in detail in the regular railroad tariffs.

Rates from Atlantic Coast ports (i.e., New York, Philadelphia and Baltimore) to Pacific Coast ports of call on most steamship lines, via the Panama Canal, are as follows: Pig iron, 30c. to 40c.; ship plates, 30c. to 40c.; ingot and muck bars, structural steel, common wire products, including cut or wire nails, spikes and wire hoops, 30c. to 40c.; sheets and tin plates, 50c.; rods, wire rope, cable and strands, 75c.; wire fencing, netting and stretcher, 50c.; pipe, not over 8 in. in diameter, 50c.; over 8 in. in diameter, 2½c. per in. or fraction thereof additional. All prices per 100 lb. in carload lots, minimum 40,000 lb.

RAILROAD EQUIPMENT BUYING

Orders and Inquiries for Locomotives and Cars Somewhat Diminished in Volume

Sharp advances in some of the specialties entering into the manufacture of railroad equipment may check somewhat further buying of cars and locomotives—at least such an opinion has lately been repeatedly expressed. The weeks activity is indicated in the following items:

The Atlantic Coast Line has ordered 2000 box cars of the Standard Tank Car Co., Sharon, Pa.

The Hocking Valley has contracted for repairs, dividing 1000 equally between the Pressed Steel Car Co. and the Greenville Steel Car Co.

The Seaboard Air Line has ordered repairs to 500 composite gondola cars at the shops of the Virginia Bridge & Iron Works.

The Union Pacific has bought 50 caboose cars of the Mt. Vernon Car Mfg. Co.

The Grand Trunk is inquiring for 1000 box and 2000 automobile cars for its lines in the United States, and for 3000 box and 700 refrigerator cars for its Canadian lines.

The Lehigh & New England is in the market for 100 composite gondolas of 50 tons capacity.

The Atchison, Topeka & Santa Fe Railroad has ordered 59 locomotives from the Baldwin Locomotive Works.

The Santa Fe has ordered 1000 refrigerator and 500 stock cars from the Pullman Co.

The Northwestern has placed 200 flat and 800 gondola cars with the General American Car Co.

The Chicago Great Western has awarded 1000 freight cars to the Pullman Co.

The Chicago & Alton has let repairs on 200 gondola cars each to the Illinois Car Co. and the Mt. Vernon Car & Mfg. Co.

The Cincinnati, Indianapolis & Western has placed 300 hopper cars with the American Car & Foundry Co.

The Rock Island has awarded repairs on 400 box cars to the Western Steel Car & Foundry Co.

The Nickel Plate has placed 300 underframes with the Illinois Car & Mfg. Co.

The Cotton Belt contemplates entering the market for 5000 cars and the Kansas City Southern is considering the purchase of freight equipment.

The Baltimore & Ohio is inquiring for 30 passenger cars and the Michigan Central for 7 baggage and mail cars.

Steel Rail Purchases

The Pennsylvania Railroad has distributed orders for 170,000 tons of 130-lb. rails for 1923 delivery among the following steel companies: United States Steel Corporation, 78,000 tons; Cambria Steel Co., 37,000 tons; Bethlehem Steel Co., 37,000 tons; Lackawanna plant of Bethlehem Steel Co., 9000 tons; Inland Steel Co., 9000 tons.

The New York Central's rail distribution is as follows, totaling 194,300 tons: Illinois Steel Co., 74,500 tons; Carnegie Steel Co., 16,464 tons; Bethlehem Steel Co., 85,036 tons; Inland Steel Co., 15,800 tons; Cambria Steel Co., 2500 tons.

The Southern Railway has purchased 40,000 tons of 100-lb. rails from the Tennessee Coal, Iron & Railroad Co., to be rolled at Ensley, Ala.

The Chicago, Burlington & Quincy has ordered 15,000 tons from the Illinois Steel Co., 4000 tons from the Inland Steel Co. and 15,000 tons from the Colorado Fuel & Iron Co., the last tonnage to be used on the Colorado & Southern and other subsidiaries as well as on the Burlington.

The Chicago, Milwaukee & St. Paul has placed 40,000 tons with the Illinois Steel Co. and 10,000 tons with the Inland Steel Co.

The Chesapeake & Ohio has ordered 10,000 tons from the Inland Steel Co. and 5000 tons each from the Illinois, Carnegie and Bethlehem companies.

The Chicago, Rock Island & Pacific has placed 5000 tons with the Inland Steel Co. and 35,000 tons with the Illinois Steel Co.

The Pere Marquette has ordered 3500 tons each from the Illinois and Inland companies and the Lackawanna mill of the Bethlehem Steel Co.

The Missouri-Kansas-Texas has placed 10,000 tons with Illinois Steel Co.

The Chicago & Northwestern and the Chicago, St. Paul, Minneapolis & Omaha have made reservations for their rail requirements, but have not yet decided on the exact tonnage which will be contracted for.

The Illinois Central has likewise reserved space with the privilege of changing the tonnage stipulated, but the division will probably correspond with the following: 40,000 tons to the Illinois Steel Co., 10,000 tons to the Inland Steel Co., 20,000 tons to the Tennessee Coal, Iron & Railroad Co. and 10,000 tons for the Central of Georgia, also to the Tennessee mill.

The Texas & Pacific has ordered 15,000 tons from the Tennessee mill.

The Nashville, Chattanooga & St. Louis has ordered 13,000 tons from the Tennessee mill.

The Nickel Plate Railroad placed 19,000 tons with the Carnegie, Lackawanna and Inland mills, the bulk going to the Carnegie Steel Co., which also took 8000 tons from the Clover Leaf Railroad and 800 tons from the Northern Ohio Traction & Light Co.

The Midvale Steel & Ordnance Co. took 3000 tons for the Ann Arbor Railroad and 500 tons for the Cleveland Frog & Crossing Co.

The Missouri Pacific and the Wabash have each purchased 15,000 tons.

FABRICATED STEEL BUSINESS

Drop in Volume of Awards as Well as of New Inquiry

Among the fabricated steel awards of the past two weeks are the following:

Oil tanks in Texas, 5100 tons, to the Petroleum Iron Works.

Ford Motor Co., at Kearney, N. J., 300 tons, to the Belmont Iron Co.

John B. Stetson Co., Philadelphia, 800 tons, to the American Bridge Co.

Bridges, Lake County, Minn., 399 tons, to American Bridge Co.

Standard Oil Co., six 80,000-bbl. oil storage tanks, two at Sugar Creek, near Kansas City, and four at Wood River, near Alton, Ill., 1500 tons, to Chicago Bridge & Iron Works.

Lafayette Investment Co., office building, Minneapolis, 300 tons, reinforced concrete construction substituted for fabricated steel.

Miami University, Oxford, Ohio, 300 tons, general contract to Dayton fabricator.

Indiana Quarries Co., Bedford, Ind., 600 tons, to Indiana Bridge Co.

Highway bridge, Lowell, Mass., 235 tons, to the McClintic-Marshall Co.

Public Schools Nos. 192 and 193, New York, 800 tons each, to A. E. Norton, Inc.

Virginian Railroad, 300 tons of plate girder work, to Virginia Bridge & Iron Works.

Chicago Trust Building, Monroe and Clark Streets, Chicago, 1032 tons, to Duffin Iron Works.

S. Scott Joy, architect, Duluth, Minn., McDougal Warehouse, 247 tons, to Minneapolis Steel & Machinery Co., Minneapolis.

Building for Illinois Publishing & Printing Co., Chicago, 318 tons, to Morava Construction Co.

Edison Co., South Boston power house extension, 960 tons, to Levering & Garrigues Co.

South Side High School, St. Louis, 600 tons, to Spuck Iron & Foundry Co.

Plant of J. A. Fay & Egan Co., Cincinnati, 800 tons, to L. Schreiber & Sons.

Gas holder, Bristol, Conn., 1000 tons, to Stacey Mfg. Co.

Gas holder, Allentown, Pa., 1000 tons, to Bartlett-Hayward Co.

Sheet mill building, Weirton Steel Co., 1600 tons, including 300 tons of corrugated galvanized sheets, to McClintic Marshall Co.

Corn Products Refining Co., plant, Pekin, Ill., 695 tons, to Vierling Steel Works.

Structural Projects Pending

Inquiries for structural steel work now being figured on include the following:

Coal pier at Norfolk, Va., for Virginian Railroad, 5000 tons.

Apartment house at Fifth Avenue and Ninety-eighth Street, New York, 1000 tons.

Bridgework, Big Four Railroad, 200 tons, bids in.

High school, Sharon, Pa., 400 tons.

Pillsbury Flour Mills Co., warehouse in Buffalo, 200 tons.

Western Maryland Terminal Railway, building, Baltimore, 153 tons.

Oak Park Trust & Savings Bank Building, Oak Park, Ill., 252 tons.

NON-FERROUS METALS

The Week's Prices

Cents Per Pound for Early Delivery

	Copper, New York		Straits Tin	Lead		Zinc	
Sept.	Lake	Electrolytic*	New York	New York	St. Louis	New York	St. Louis
27	14.25	13.75	32.37½	6.62½	6.25	7.20	6.85
28	14.25	13.75	32.57½	6.65	6.30	7.20	6.85
29	14.25	13.75	32.75	6.65	6.30	7.20	6.85
30	14.25	13.75	....	6.65	6.30	7.20	6.85
Oct.							
2	14.25	13.75	33.00	6.65	6.30	7.17½	6.82½
3	14.25	13.75	32.87½	6.65	6.30	7.15	6.80

*Refinery quotation.

New York

NEW YORK, Oct. 3.

Most of the markets are quiet and prices are steady to easy. Business in copper is fair at unchanged prices. Transactions in tin have been moderate at slightly higher values. The lead market continues strong but zinc is slightly easier.

Copper.—The electrolytic copper market continues its steady course with prices neither up or down in many weeks. Demand continues good and there is no let-up in export business. It is probable that, were transportation conditions better, business might be brisker and this is also true of the lead and zinc markets. Electrolytic copper to-day is quoted at 13.75c., refinery, or 14c., delivered, for the remainder of the year.

Copper Averages.—The average price of Lake copper for the month of September, based on daily quotations in THE IRON AGE, was 14.16c. The average price for electrolytic copper was 13.75c., refinery, and 14c., delivered.

Tin.—With the exception of one day in the past week the market has been quiet and featureless. On Thursday, Sept. 28, about 300 to 400 tons of Straits tin was sold, consumers being largely the buyers, and the deliveries involving spot to November-December shipment from the East. Most of this business was done at close to 32.50c. At the close of business on that day the market stiffened slightly with 32.60c. bid, but no sellers. Because of the Jewish holiday yesterday very little business was done and the market to-day has also been quiet. Spot Straits tin was quoted to-day at New York, 32.87½c. September deliveries into consumption were surprisingly large and exceeded the most optimistic estimates by 400 to 500 tons. The total deliveries were 5050 tons, with 1236 tons reported in stock and landing on Sept. 30. Imports to Oct. 1 this year have been 41,715 tons against 15,578 to Oct. 1, 1921. The London quotations to-day were £164 15s. for spot standard, £165 12s. 6d. for future standard and £165 2s. 6d. with the market strong.

Lead.—As compared with recent weeks, the market has turned rather quiet and while spot delivery is still scarce, there is not so much anxiety to buy. Sales have been made in the outside market at 6.65c., New York, with small lots of 15 tons or over in fair quantities for spot delivery at 6.75c. The leading interest advanced its quotations again on Sept. 27 to 6.35c., New York, and 6.15c., St. Louis, an increase of 10 points. We quote the outside market to-day at 6.30c., St. Louis, or 6.65c., New York, for early delivery.

Zinc.—Inability in many cases to deliver zinc on the part of producers and to make shipment of product on the part of users of zinc has caused an easing in the entire market and a slight drop in prices. Prime Western zinc for early delivery is quoted at 6.80c. to 6.85c., St. Louis, or 7.15c. to 7.20c., New York. Most producers are well sold up for October and in some cases into November, but some metal is available at second hand at the prices mentioned.

Antimony.—Chinese metal in wholesale lots for early delivery is quoted at 6.75c., New York, duty paid.

Aluminum.—The leading interest continues to quote 19.10c., f.o.b., for virgin metal, 98 to 99 per cent pure, while the same grade imported from foreign producers is quoted nominally at 18.25c. to 19c. per lb., New York, duty paid.

Old Metals.—Business has been better this week with a slightly higher market. Dealers' selling prices are as follows:

	Cents Per Lb.
Copper, heavy and crucible	13.50
Copper, heavy and wire	12.75
Copper, light and bottoms	11.25
Heavy machine composition	10.50
Brass, heavy	8.25
Brass, light	6.50
No. 1 red brass or composition turnings	9.50
No. 1 yellow rod brass turnings	7.50
Lead, heavy	5.50
Lead, tea	4.00
Zinc	4.25

Chicago

OCT. 3.—Tin has advanced slightly but otherwise the market is quiet and unchanged. Lead and zinc prices have apparently reached the peak and recessions are looked for. Among the old metals zinc, brass and certain grades of copper have gone up. We quote, in carload lots, lake copper, 14.50c.; tin, 34c. to 34.50.; lead, 6.37½c.; spelter, 6.90c.; antimony, 8.50c.; in less than carload lots. On old metals we quote copper wire, crucible shapes and copper clips, 11c.; copper bottoms, 9.75c.; red brass, 9c.; yellow brass, 7c.; lead pipe, 4.50c.; zinc, 4c. pewter, No. 1, 20c.; tin foil, 22.50c.; block tin, 26c., all buying prices for less than carload lots.

St. Louis

OCT. 3.—We quote: lead, 6.35c. and zinc, 6.85c., carlots. On old metals we quote: light brass, 3.50c.; heavy red brass, and light copper, 7c.; heavy yellow brass, 4c.; heavy copper and copper wire, 7.50c.; zinc, 2c.; pewter, 15c.; tin foil, 20c.; tea lead, 2c.; aluminum, 9c.

Large Coal Production

WASHINGTON, Oct. 3.—Production of bituminous coal for the week of Sept. 25-30, is estimated by the Geological Survey at from 9,600,000 to 9,900,000 tons. The output of anthracite for the same week is placed at 1,850,000 tons. Heavy loadings of soft coal in the early part of the week, 38,804 cars on Monday and 33,396 cars on Tuesday, were largely offset by a decline later in the week. Under the stimulus of active demand, soft coal is now being offered for shipment up to the ability of the rail and water carriers to transport it. The present weekly rate of production is nearly 1,000,000 tons above that of the year of depression, 1921, but is from 1,500,000 tons to 3,000,000 tons below the years 1917-1920, inclusive.

Alabama Export Shipments

BIRMINGHAM, ALA., Oct. 3.—Recent export movements from Alabama mines and mills, principally via the Warrior barge line and Mobile, have been as follows: 2000 tons of phosphate made of Ensley steel mill slag for New Zealand; 2000 tons (third cargo) of coal for Callao, Peru; 2195 tons of Ensley steel rails for Antofagasta, Chile; 6000 tons of sulphate of ammonia, steel rails, pig iron and track accessories from Fairfield and Ensley mills to China, Japan and Korea; wire mill products to Argentine and Brazil and the Windward Island; sugar house machinery to Antilla, Chaparra, Havana and other Cuban points; a small tonnage of steel hoops and bands to China. The Orient is to get another 6000-ton cargo of rails this week.

The General Electric Co. has acquired a tract of about 175 acres of farm and wood lands at Parsippany, N. J., for the establishment of a recreation center and probably a summer camp, with outdoor sport facilities, for employees of the Newark, Harrison, Ampere, Waverly and Belleville plants, all located in the northern New Jersey district. The company is now operating a similar recreation center at Lake George, N. Y.

PERSONAL

Howard Coonley, president Walworth Mfg. Co., Boston, was a guest of the Pilgrim Publicity Association at a luncheon at Hotel Bellevue, that city, last week. During his address, which was in the form of an appeal for New England business interests to forge ahead, he paid glowing tribute to Charles M. Schwab's personality and business ability. Mr. Coonley during the war, as a director of administration of the Emergency Fleet Corporation, came in contact with Mr. Schwab.

Charles L. Newcomb, Dean Works, Worthington Pump & Machinery Corporation, Holyoke, Mass., has been made chairman of a newly formed western Massachusetts section of the American Society of Mechanical Engineers.

A. L. Lee, who has been in the engineering department at the Ambridge, Pa., works, American Bridge Co., has been appointed resident engineer, United States Steel Products Co., at Bombay and Calcutta, India. He was tendered a farewell dinner and presented a gold watch by his former associates prior to his departure to his new post. Mr. Lee seryed overseas during the war, reaching the rank of major in the Engineer Corps.

H. F. King, formerly of the Kings Refractories Co., has joined the sales and service department of the Quigley Furnace Specialties Co. in New York.

John F. Miller, vice-chairman, board of directors Westinghouse Air Brake Co., Wilmerding, Pa., recently was elected a trustee of Wooster College, Wooster, Ohio, from which he was graduated in 1881. Beside his connection with the Westinghouse company, Mr. Miller is identified with several banks and Pittsburgh business enterprises.

P. L. Coyle, formerly bar mill superintendent Jones & Laughlin Steel Co., Pittsburgh, and later works manager Electric Alloy Steel Co., Charleroi, Pa., has been appointed superintendent of bar mills Witherow Steel Co., Neville Island, Pittsburgh.

Joseph Becker, consulting engineer, Koppers Co., Pittsburgh, will present a descriptive paper on the new Koppers combination oven at a meeting of the Eastern States Blast Furnace and Coke Oven Association, to be held Oct. 5 at the Lafayette Hotel, Buffalo. Mr. Becker is the inventor of the new Koppers oven, an experimental battery of which has been in operation in the plant of the Koppers Co. in Chicago for almost a year, and the type which will be installed in the new plant of the Weirton Steel Co., Weirton, W. Va., and the addition to the Clairton, Pa., plant, Carneige Steel Co.

Keith R. Roding has been appointed works manager of the Chrome Steel Works, Chrome, N. J.

Edwin C. Welch, who has been in charge of tubular products sales for the Consolidated Steel Corporation for the past three years, has resigned, effective Sept. 15, to become the Eastern representative of the Kelmet Metals Co., Inc., Cleveland. Mr. Welch will be located in New York and will devote a large part of his time to steel mills, for which his company manufactures a special rolling mill bearing.

Samuel McCutcheon, assistant secretary of the North & Judd Mfg. Co., hardware manufacturer, New Britain, Conn., during the past week was elected treasurer of the company.

P. G. Merrow, secretary and treasurer the Merrow Machine Co., Hartford, Conn., sailed recently for Great Britain and the Continent on a business trip in the interests of the company.

Prof. Alfred Stansfield, professor of metallurgy, McGill University, Montreal, Can., will address the Cleveland district section of the American Iron and Steel Electrical Engineers, Oct. 9, on "Electric Smelting of Iron Ores." The meeting will take place at the rooms of the Cleveland Engineering Society, Hotel Winton.

Oswald Fowler, Rogers, Brown & Co., New York, has returned from a short business trip to England.

Alexander D. MacDonnell, Lima, Ohio, has been elected president and general manager of the North Electric Co., Galion, Ohio, manufacturer of automatic telephone switch boards.

Roy C. Ellis, formerly assistant sales manager and field representative of the automotive division Standard Steel Car Co., Pittsburgh, has joined the sales staff of Courier Motors Co., Sandusky, Ohio, as factory representative.

W. K. Strickland, recently with the General Motors research laboratories, has become affiliated with the Cadillac Motor Car Co. as assistant chief engineer.

J. W. Floto, for four years district sales manager at Detroit of the Globe Seamless Tubes Co., has been appointed general manager of sales, with office in the Peoples Gas Building, Chicago. F. J. O'Brien, vice-president and general manager of the company, is moving his office to Milwaukee, where the mills are situated.

Raymond K. Bowden, Niles, Ohio, has been appointed instructor in metallurgy for 1922-23 at Carnegie Institute of Technology, Pittsburgh. He is a graduate of Ohio State University, class of 1920, with a bachelor's degree of Engineering in Mining. His practical experience covers two years as superintendent of inspection with the Central Steel Co. at Massillon, Ohio, and one year as assistant to the heat treater at the Crucible Steel Co. in Pittsburgh. The department of metallurgy at Carnegie Institute was recently selected by the United States Naval Academy as its graduate school of metallurgy. Beginning this year, two officers from the Naval Academy have been assigned to take up advanced work in metallurgical subjects at the Pittsburgh institution.

R. C. Kirk, who retired from the presidency of LaBelle Iron Works, Steubenville, Ohio, at the formation of the Wheeling Steel Corporation, a little more than two years ago, has become affiliated with the Follansbee Bros. Co., Pittsburgh, having been elected vice-president, treasurer and a director of that company. Mr. Kirk takes with him an experience of more than 25 years in the steel industry. He started in 1895 with the old Falcon Sheet & Tin Plate Co., Niles, Ohio, plants of which later were absorbed by the American Sheet Steel Co. and American Tin Plate Co. at the beginning of the present century. He then became an accountant in the New York office of American Sheet Steel Co., and held this position until 1903, when he joined LaBelle Iron Works as auditor. The following year he was made treasurer and in 1913 became secretary-treasurer of the company. He was elected president in 1915 and held this position until 1920, when he retired and severed his connection with LaBelle Iron Works. Mr. Kirk will make his headquarters in Pittsburgh, but for the present will continue to make his home in Steubenville, Ohio, and thus will be able to maintain contact with the plants of the Follansbee Bros. Co. at Follansbee, W. Va., and Toronto, Ohio.

James P. Davis, who has been chief of the shipping and order department, National works, National Tube Co., McKeesport, Pa., has been transferred to the general order department of the company, Pittsburgh, as assistant to J. A. Caughey, chief of that department. Mr. Davis's successor at McKeesport is C. H. Starr.

John F. Miller has been elected a trustee of Wooster University, Wooster, Ohio. He was formerly president and is now vice-chairman of the Westinghouse Air Brake Co., Wilmerding, Pa.

Sterling Hubbard, for many years resident manager at Cleveland for Rogers, Brown & Co., is now vice-president of the First National Bank of Santa Barbara, Cal.

James A. Buell has resigned as assistant general manager of the United Alloy Steel Corporation, Canton, Ohio, to become general superintendent of the Donner Steel Co., Buffalo, N. Y.

John R. Foster, formerly general manager and treasurer, National Sales & Trading Co., Cleveland, has become affiliated with the David J. Joseph Co., Cincinnati, and will have charge of pig iron and steel sales for that company, with headquarters at Youngstown, Ohio.

OBITUARY

EDGAR B. TYLER, vice-president of the Mississippi Valley Structural Steel Co., and one of the founders of the Decatur Bridge Co., died suddenly of heart trouble in St. Louis, Sept. 27. He had come from his home in Decatur, Ill., to inspect the company's steel plant. Mr. Tyler was born in Waukesha, Wis., 57 years ago, and at an early age became interested in the steel business, beginning his career with the Indiana Bridge Co., Muncie, Ind. In 1902, together with G. A. Caldwell, T. L. Blackburn and W. M. Wood, all employees of the Indiana Bridge Co., he founded the Decatur Bridge Co., which was located in Decatur, Ill., with T. L. Blackburn as president; G. A. Caldwell, vice-president; W. M. Wood, treasurer and chief engineer, and E. B. Tyler as secretary and general manager. This shop was started for bridge building, but its prosperity warranted expansion and it finally developed into a structural shop. In May, 1922, it was merged with the Christopher & Simpson Iron Works, St. Louis, the name being changed to the Mississippi Valley Structural Steel Co. Mr. Tyler was prominent in local affairs in Decatur.

EDGAR B. TYLER

WALTER CRAFTS WITHERBEE, chairman board of directors Witherbee, Sherman & Co., Port Henry, N. Y., died at Port Henry, Sept. 29. Mr. Witherbee was born in Port Henry, July 1, 1856, the son of Silas H. Witherbee, founder of the firm of Witherbee, Sherman & Co. He was graduated from Yale in 1880 and soon became a member of the firm. On the incorporation of the firm in 1900 he was made treasurer and retained that office until the death of his cousin, F. S. Witherbee, who was the president of the company. He then became chairman of the board. He was vice-president of the Port Henry Iron Ore Co. for many years. Mr. Witherbee made his home in Port Henry from the time he entered business and was active in local affairs. He was prominent in Republican politics and exerted a large influence in northern New York. President Roosevelt appointed him collector of the Port of Champlain, with headquarters at Plattsburg, where he served for many years. He was a member of the University Club, New York, New York Chamber of Commerce, American Iron and Steel Institute and American Institute of Mining and Metallurgical Engineers. He married Miss Annie E. Gautier, daughter of the late Dr. J. H. Gautier, who was identified with the Gautier Works, afterward the Cambria Steel Co. Mrs. Witherbee and three children survive: Silas H., Mrs. Merrill, wife of Lieutenant Commander Merrill, now in Constantinople, aide of Rear Admiral Bristol, and Miss Annie Witherbee.

J. P. PERO, former president of the American Foundrymen's Association, died on Saturday, Sept. 23, at Indian Orchard, Mass. Mr. Pero was born in Waltham, Mass., Dec. 9, 1856, the eldest of a family which for three generations has figured prominently in New England foundry development. When 13 years old, he made his start as an apprentice molder and he was foreman of a foundry at 25 having gained a reputation as a skillful heavy work molder. His activity in gray iron work covered a period of 30 years, but latterly he had been identified with malleable plants. He was identified with the management of some of the leading foundries in New England and the Middle West. In 1887 he organized the New England Foundrymen's Association. Besides being president of that organization in 1916 and 1917 he was a member of the directorate from the time of its organization. Recently he was general superintendent of the Canadian Steel Foundries Co., Ltd., Montreal, and previously for 11 years general superintendent and sales manager of the Missouri Malleable Iron Co., East St. Louis, Ill.

LAWRENCE DONAHUE, rolling mill superintendent, International High Speed Steel Co., Rockaway, N. J., was instantly killed when an automobile in which he was riding collided with a Lackawanna train at a crossing at Rockaway, N. J., recently. Mr. Donahue was employed by the Carpenter Steel Co., Reading, Pa., for 12 years and in 1916 he entered the service of the International High Speed Steel Co.

FRANK H. PARKER, president Parker Motor Truck Co., Mueller & Son Box Co., and numerous other important industrial enterprises in Milwaukee, died Sept. 29 at Columbia Hospital, following an operation. He was 68 years old.

WILLIAM G. LUITINK, secretary-treasurer Luitink & Sons Mfg. Co., Milwaukee, manufacturer of hardware specialties, wood and metal patterns, etc., died Sept. 22 at the age of 58 years from paralysis. Three brothers, John, Peter and Henry, are associated in the business.

HERBERT C. FOLLINGER, manager of the Chicago office, Chain Belt Co., died of pneumonia at his home in Chicago, on Sept. 27, aged 66. He had been ill but a few days, and the announcement of his death will come as a shock to his many friends in the industrial world, where he was well known. Mr. Follinger was born at Fort Wayne, Ind. In 1902 he was graduated from the Chicago Manual Training School, now a part of the University of Chicago, and entered the employ of the Otis Elevator Co. He became associated with the Chain Belt Co. in 1914, and in 1916 was appointed district manager of the Chicago territory.

PERRY HUME DAVIS, for 30 years superintendent Moline Malleable Iron Co., St. Charles, Ill., died recently at his home in that city, aged 66. He entered the employ of the Moline company as a molder and later went to the Union Malleable Iron Works at Moline as foundry foreman, holding that position for 13 years. He was then for two years in a foundry of the Southern Pacific Railroad at Sacramento, Cal., and upon returning to Moline was appointed superintendent of the Moline Malleable Iron Co. When the plant was destroyed by fire in 1893 he took charge of the new foundry, which was constructed at St. Charles. The St. Charles plant in turn was razed by fire in 1915 and Mr. Davis laid out the present plant. Resigning in June, 1920, he continued to give the company his counsel as a malleable castings specialist.

S. D. L. JACKSON, 67, prominent attorney of Youngstown, Ohio, and for many years legal adviser to managers of various steel properties, died Oct. 1 from acute diabetes, following a prolonged illness. For several years prior to his death he had been general manager of the Carbon Limestone Co., supplying flux stone to Valley blast furnaces. He was closely associated in other enterprises of Robert Bentley, director of the Youngstown Sheet & Tube Co., president of the Ohio Iron & Steel Co., and identified with many other industrial enterprises.

Work has been started on the demolition of the old Carnegie Steel Co. mill at Greenville, Pa., abandoned about four years ago when the McDonald mills, Youngstown, Ohio, were put in operation. Officials of the Carnegie company inspected the plant and decided that the equipment was out of date and worth more as junk than standing.

The Boston office of the Lackawanna Steel Co., fifth floor, 40 Central Street, has been discontinued, a consolidation with the Bethlehem Steel Co., tenth floor, 141 Milk Street office having been made.

British Iron and Steel Market

Less American Buying of British Pig Iron — Belgium Sells 50,000 Tons of Rails to Argentina

(*By Cable*)

LONDON, ENGLAND, Oct. 3.

American new buying of pig iron is diminishing, but substantial quantities are still due for shipment. Home consumers are more active. One more Cleveland furnace has been re-started, but no general increase in output is considered probable yet, owing to increased costs of fuel.

Hematite is steady. Moderate parcels have been sold to Belgium and Italy and makers' stocks are diminishing.

Finished steel is improving slowly. Australia has bought plates and angles. Canada is buying plates and Japan is inquiring for bridge-building material. India is inquiring for plates. The home trade is quiet, but the new contracts for the London tubes and for Soudan irrigation works will benefit some steel makers.

Clyde September output of ships was eleven vessels of 34,914 tons gross register.

Prospects of an early settlement of the Ebbw Vale dispute appear good.

Continental business is moderate, South America, India and China making purchases. The Far East is inquiring for material. Belgium has booked rail orders amounting to 50,000 tons for the Argentine and is negotiating with Brazil in connection with 100,000 tons.

Continental pig iron is firmer on good home demand, sales to Germany and to America.

Tin plate is firmer on increased demand and there is less inclination on the part of the works to accept low prices. A further 150,000 boxes of oil plates have been booked for the East.

Galvanized sheets are quiet and easier. Japanese specifications for black sheets have sold at £14 10s. (2.85c. per lb.) f.o.b.

We quote per gross ton, except where otherwise stated, f.o.b. maker's works, with American equivalent figured at $4.40 per £1, as follows:

Durham coke, delivered	£1	7½s.	to	£1	8s.	$6.05	to	$6.16
Cleveland No. 1 foundry	4	17½				21.45		
Cleveland No. 3 foundry	4	12½	to	4	15	20.35	to	20.90
Cleveland No. 4 foundry	4	10				19.80		
Cleveland No. 4 forge	4	5				18.70		
Cleveland basic	4	0				17.60		
East Coast mixed	4	9	to	4	11	19.58	to	20.02
Ferromanganese	15	0				66.00		
Ferromanganese*	14	10	to	14	15	63.80	to	64.90
Rails, 60 lb. and up	7	5	to	8	0	31.90	to	35.20
Billets	7	2½	to	8	0	31.35	to	35.20
Sheet and tin plate bars, Welsh	7	7½				32.45		
Tin plates, base box	0	18⅜	to	0	18½	4.04	to	4.07
						C. per Lb.		
Ship plates	8	10	to	9	0	1.67	to	1.77
Boiler plates	11	10	to	12	0	2.26	to	2.36
Tees	9	0	to	9	10	1.77	to	1.87
Channels	8	5	to	8	15	1.62	to	1.72
Beams	8	5	to	8	15	1.62	to	1.72
Round bars, ¾ to 3 in.	9	0	to	9	10	1.77	to	1.87
Galvanized sheets, 24 g.	16	2½	upward			3.17		
Black sheets	12	0				2.36		
Steel hoops	11	0	&	11	10*	2.16	&	2.26*
Cold rolled steel strip, 20 g.	23	2½				4.54		
Cotton ties, Indian specifications	15	0				2.95		

*Export price.

Continental Prices, All F. O. B. Channel Ports, Delivery as Specified

No. 3 foundry pig iron:								
Belgium, Nov., Dec.	£4	5s.	to	£4	7½s.	$18.70	to	$19.25
Luxemb'g, Nov., Dec.	4	5	to	4	7½	18.70	to	19.25
France, Nov., Dec.	4	5	to	4	7½	18.70	to	19.25
Billets:								
France, Nov., Dec.	5	14	to	5	17½	25.08	to	25.85
Luxemb'g, Nov., Dec.	5	14	to	5	17½	25.08	to	25.85
Lorraine, Nov., Dec.	5	14	to	5	17½	25.08	to	25.85
Wire nails (keg basis):								
Germany	0	14½				3.19		
Belgium	0	20½				4.51		
Wire rods, 5 mm. (0.2 in.):								
Belgium	7	5	to	10	7½	31.90	to	45.65
Angles:						C. per Lb.		
Belgium, September	7	7½				1.45		
Tees:								
Belgium	8	5				1.62		
Merchant bars:								
Belgium, Nov., Dec.	7	2½	to	7	10	1.40	to	1.47
Luxemb'g, Nov., Dec.	7	10	to	7	15	1.47	to	1.52
France, Nov., Dec.	7	10	to	7	12½	1.47	to	1.50
Germany, Jan., Feb.	7	2½	to	7	10	1.40	to	1.47
Joists (beams):								
France, Nov., Dec.	6	15				1.33		
Belgium, Nov., Dec.	6	12½	to	7	0	1.30	to	1.37
Luxemb'g, Nov., Dec.	6	10	to	7	0	1.28	to	1.37
Channels:								
Belgium	7	10	to	7	12½	1.47	to	1.50
¼-in. plates:								
Germany, Dec., Jan.	7	5	to	7	7½	1.42	to	1.45
Belgium, Nov., Dec.	7	12½	to	7	15	1.50	to	1.52
Luxemburg, Oct.	7	7½	to	7	15	1.45	to	1.52
France, not offered.								
⅛-in. plates:								
Germany	9	0				1.77		
No. 8 gage wire:								
Belgium	14	10⅝				2.85		

Basic Business Conditions Favorable

(*Continued from page* 856)

in an effort to get delivery where delivery was almost ungettable, toppled both production and prices in a descent which did not pause for nine months.

Pig iron (and steel) having reached a point where their production was less than half as great, with respect to the base of 1919, as with production in general, with consequent great depletion of stocks everywhere, the slow climb back to normal became inevitable. With but a momentary check, at the beginning of this year, this climb was steady and fairly uniform until June, when pig iron stood at 94 per cent of the 1919 average and steel was well above 100. Even the coal strike of April produced, at the time, scarcely a flurry. But its insidious effects began to tell before the summer was far advanced and, coupled with the railroad strike in July, caused a sharp collapse in production in August—ingots falling from 101 to 90 and pig iron from 92½ to 70.

Of the Future

Production in all lines is almost certain to be higher, in the last quarter of 1922, than we have known since 1920. In many cases it should go above the output for that year. Steel will not, nor will pig iron, largely because of transportation difficulties which cannot be removed in time. And many other industries will be hampered by shortage of coal and by non-delivery of necessary materials, themselves delayed by lack of coal at points of production.

Such virile buoyancy as the productive capacity of this country has shown twice this year, however, in rebounding above "par" after a sharp setback due to strikes in essential services, is proof that demand exists and must be satisfied. And the only way it can be satisfied is through production. Food, buildings, vehicles, lumber, paper and non-ferrous metals all stood above 100 during August, in spite of all adverse circumstances. No group on the list, save steel ingots, showed a recession from July, and in that one case it was sheer absence of fuel which forced it. With both strikes now composed, industry may be expected to advance steadily for some months, and to be limited, chiefly, by the ability of the railroads to serve it.

Changes in Westinghouse District Office Personnel

Several changes in the personnel of several of its district offices have been announced by the Westinghouse Electric & Mfg. Co. The territory hitherto handled from its Buffalo office has been united with its New York office, with E. A. Allen, manager, New York office, as manager of the combined offices. C. W. Underwood, who has been Buffalo manager, has been made Northern representative with offices in Buffalo. Other changes affecting these offices include the appointment of W. R. Marshall as branch manager, Buffalo office; of E. W. Loomis as manager, industrial division New York office; of W. A. Rossell as special power representative of the combined districts and of G. T. Dunklin as manager merchandising division of the New York office. The supply and power divisions, New York office, have been merged into the central station division under C. E. Stephens, manager, and the present railway division will hereafter be known as the transportation division.

In the San Francisco office the power division is changed to the central station division and W. P. L'Hommedieu has been appointed manager. Mr. L'Hommedieu also will be responsible for the sale of supply apparatus in the San Francisco district. The railway division has been changed to the transportation division and E. A. Palmer has been appointed manager. The establishment of a merchandising division, with H. L. Garbutt as manager also is announced.

The appointment of S. W. Perry as chief clerk, of J. S. Warren as manager, central station division, and G. F. Leake as manager, merchandising division, comprise the changes made in the St. Louis office.

W. L. Southwell has been made manager, merchandising division, Atlanta office, and E. V. Peterson has been appointed to a similar position in the Seattle office. J. W. Robinson, manager, central station division, Chicago office, has also been assigned the general responsibility for the sale of supply apparatus in the Chicago territory and W. A. Dalrymple has been made district auditor in the Chicago district.

Changes in the Boston office include the establishment of a central station division with C. M. Bates as manager and F. L. Nason as assistant manager. A merchandising division has been established in that office with Mr. Nason as acting manager. J. P. Alexander has been appointed manager of a new transportation division in the Boston office.

Green Engineering Co. Absorbed

The International Combustion Engineering Corporation has acquired the entire capital stock of the Green Engineering Co., East Chicago, Ind., manufacturer of chain grate stokers, auxiliary boiler room equipment, special furnace arches, and general foundry work. Stockholders of Green Engineering Co. have received in full payment for all the stock of their company 47,000 shares of International Combustion Engineering stock.

The International Combustion Engineering Corporation, New York, has purchased the entire capital stock of the Green Engineering Co., East Chicago, Ind. The International company is a holding corporation which also controls the Combustion Engineering Corporation, New York.

Armstrong Steel Co.'s New Plant

The Armstrong Steel Co., Fort Worth, Tex., recently organized under Delaware laws with capital of $2,500,000, to take over and succeed to the iron and steel plant and business of the George W. Armstrong Co., is concluding negotiations for the purchase of property at Houston, Tex., for the construction of a new plant, estimated to cost in excess of $1,000,000. The proposed mills will be devoted to the production of steel products exclusively, utilizing a combination of pig iron and scrap iron under open-hearth process, and will be equipped for an annual output of approximately 60,000 tons. The company has recently disposed of an issue of preferred stock to provide funds for the expansion. The present Fort Worth plant, with capacity of about 40,000 tons a year, will be continued in service for some time, with company headquarters transferred to Houston, following the completion of the projected works. George W. Armstrong is chairman of the board, and R. L. Van Zandt, president.

Colorado Fuel & Iron Co. Employees at Work Throughout Strike Period

The Colorado Fuel & Iron Co. is much pleased by the showing its coal miners made during the strike period. Officials believe that this record furnishes additional evidence of the success of the industrial representation plan.

Early last year the company negotiated a reduction of wages with its employees. The new scale was about the same as that of 1917, 1918 and 1919, and was equivalent to a $2.50 reduction in day wages and 24c. per ton to the miner. After this arrangement was made the United Mine Workers called a strike and some of the employees quit work. The State Industrial Commission took jurisdiction, conducted hearings, and decided that a majority of the men had accepted the reduction and that the scale was a fair one. When the general strike was called, April 1, 1922, strenuous efforts were made by the organizers to induce the employees of the company to quit work, but without result except at two or three mines that were strongly organized. At a number of mines not a single individual quit work on April 1, and the production at the mines which were working increased from 222,048 tons in April to 285,503 tons in August. Throughout the summer the organizers and agitators were working among the company employees, doing their utmost to strengthen their organization, but without avail. The normal tonnage of the company, with all mines operating, is about 325,000 per month. Two of the mines have been idle since March, 1921, on account of lack of business. The monthly tonnages since Jan. 1 have been as follows:

January	215,426	May	278,486
February	211,557	June	277,540
March	269,278	July	256,736
April	222,048	August	285,503

Atlas Steel Corporation Formed

Shareholders of both the Electric Alloy Steel Co., Youngstown, Ohio, and the Atlas Crucible Steel Co., Dunkirk, N. Y., have formally ratified the merger of these interests into the Atlas Steel Corporation, a new corporation with a New York charter. For some time the properties have been operating under unified management. With an annual productive capacity of 45,000 tons of high speed and special analysis steels, the company will rank as the second largest independent producer in its field, in this country. Offices of the Electric Alloy company at Youngstown will be closed at once, and new executive quarters opened at Dunkirk. Louis J. Campbell, who was president of the Youngstown constituent, will be chairman of the board and chief executive officer of the new corporation, located at Dunkirk.

Nagle Steel Co. Organized

The Nagle Steel Co., Philadelphia, has been organized under Delaware laws with capital of $300,000, by George H. Heck, 518 Commercial Trust Building, and associates, to operate the plants of the company of the same name, bankrupt, recently acquired by the organizing interests, at Pottstown and Seyfert, Pa. Operations have been resumed at the plate mill at Pottstown, effective Sept. 21, under double shift, and the Seyfert mill will be placed in service about the middle of October.

The Colvin Foundry Co., Globe Street, Providence, R. I., has let the contract for an addition to its foundry, 60 ft. high, 100 x 100 ft., of brick and steel construction.

Trade Changes

The Bridgeport Brass Co., Bridgeport, Conn., announces the opening of a Detroit office in the General Motors Building, with Frank H. Longyear as district manager.

E. E. Steiner & Co., Inc., Newark, N. J., manufacturer of industrial ovens, and Tilley & Brown, metal heating engineer, Plainfield, N. J., have combined to promote the sales of the former company, the latter concern now being sole representative in all territories. Heretofore Tilley & Brown has specialized in high temperature furnace work.

Johns-Manville, Inc., has been appointed joint selling agent by the H. H. Robertson Co. All asbestos protected metal roofing, siding, accessories and ventilators will be manufactured and shipped from the plant of H. H. Robertson Co. at Ambridge, near Pittsburgh. In the manufacture of asbestos protected metal products by H. H. Robertson Co. Johns-Manville asbestos saturated felts will be used, thus affording the advantages of the experience of one company in the manufacture of saturated asbestos felts and also the experience of the other in the fabricating of the finished product. Asbestos protected metal is largely used for all conditions where an unprotected metal or other equally perishable roofing material would quickly disintegrate. Such conditions are frequently found in foundries, steel mills, chemical plants, mines, railroads and most industrial buildings in tropical countries.

Reorganization of the Commercial Shearing & Stamping Co., Youngstown, Ohio, has been effected. The company produces pressed and stamped metal products. Its plant is operating at a rate close to normal and new orders promise maintenance of such a rate. Additional machinery has been purchased, involving expenditure of $30,000. Stockholders have elected these directors: W. A. Beecher, George F. Alderdice, Guy Ohl, Charles B. Cushwa, George Donaldson and Nathan Folsom. Officers are: President, W. A. Beecher; vice-president, G. F. Alderdice; secretary, Guy Ohl, and treasurer, Nathan Folsom.

The Asa S. Cook Co., Hartford, Conn., manufacturer of wood screw and automatic bolt machinery, moved its Cleveland office Oct. 1 to 344 Engineers' Building. Ernest W. Duston has charge of this office, which covers the middle western territory. The Cook Co. has recently redesigned its bolt machinery and has also brought out a new automatic feed devised by Mr. Duston which is being applied to all of its machines. The company also has placed on the market a new cap screw shaver.

The Brown Instrument Co. announces the opening of its New England branch at 185 Devonshire Street, Boston. George Goodman is in charge.

C. F. Carrier, one of the founders of the Cronk & Carrier Mfg. Co., hardware specialties, Elmira, N. Y., has disposed of his holdings in the company to Fayette Nims, Hornell, N. Y. Owing to poor health, both C. F. and G. H. Carrier have retired from the company. Mr. Nims, whose experience in the wholesale hardware business covers a period of 15 years, took over the entire holdings of the Carrier family and is now president and treasurer of the company.

The London Steam Turbine Co., pumps, generators, stokers and all mechanical drives, P. O. Box 436, Troy, N. Y., has moved its office and factory from Springfield, Mass., to the above address. This company is successor to the Steam Motors Co.

Charles S. Roberts has formed The C. S. Roberts Co., Room 519, Machinery Hall, Chicago, for the sale of steel products, including sheets, strip steel, merchant bars and metal specialties. Mr. Roberts was in the structural sales department, Bethlehem Steel Co., Chicago, until three years ago, when he resigned to engage in other business.

The Phoenix Brass Foundry, 857 Springfield Avenue, Irvington, N. J., has completed the erection of its new brass foundry, which is equipped for making castings in bronze, brass and aluminum. In connection with the foundry it will also maintain a large shop for machining, finishing and assembling.

Offices of the Youngstown Steel Co., which is building a mechanical puddling plant at Warren, Ohio, will be removed from the Realty Trust Building, Youngstown, to a site near the plant by the end of the month. Construction has progressed to the point where the presence of engineers and officials is necessary, rendering the change advisable.

The Midland Steel Sales Co., Chicago, has moved its office from the Peoples Gas Building to 534 McCormick Building.

Directors of the Williams Tool Corporation deferred the regular dividend payment on the preferred stock at a meeting held last week. The company has been paying dividends at the rate of $2 per share.

Plans of New Companies

The Par-Kar Coach Co., St. Louis, Mich., which was recently incorporated, is manufacturing parlor car motor equipment. It is buying its materials in the open market for a time. C. O. Westfalt heads the company.

The Service Mfg. Co., 331 Monger Building, Elkhart, Ind., has been incorporated with a capital of $20,000 to manufacture automobile equipment, parts and accessories. It will specialize in the Service rim tool for which contracts have been awarded. H. M. Smith is general manager.

The Adams Weighing Machine Co., New York, has been incorporated with a capital of $20,000 to manufacture weighing equipment, foundry supplies and kindred products. The incorporators are: O. Adams, H. Allison and J. Dirnagl. J. M. Betts, 233 Broadway, is corporate representative.

The Mack Lock Co., 289 Astoria Avenue, Long Island City, has been incorporated with a capital of $20,000 to manufacture locks and locking devices for automotive service. The main item of manufacture is a patented locking device. Its offices will be located at 14 West Forty-ninth Street, New York. The incorporators are C. Mack and C. Nessler.

The Massachusetts Gear & Tool Co., Woburn, Mass., which purchased the business and properties of the Woburn Gear Works some time ago, was recently incorporated under the laws of Massachusetts to manufacture gears, tools, etc. It is in a position to handle gears, worms, sprockets and ratchets of various kinds up to and including 4-P. E. R. Lyman is president of the new organization.

The Elmore Iron Works, Inc., 301-303 Third Avenue, Brooklyn, has been incorporated with a capital of $10,000 to operate a general iron-working and metal products plant. It will handle limited quantities of sheets. The incorporators are A. J. Vitale, L. Christen and J. Marro.

The Hendry Machine & Engineering Co., Fort Myers, Fla., which was recently incorporated, is conducting a general line of engineering and construction, boat building and general marine work, dry docks and marine ways. It designs and constructs steam electric power stations and industrial plants. Bard L. Hendry heads the company.

The Dil-Sul Instantaneous Water Heater Co., Inc., 625 Poydras Street, New Orleans, recently incorporated with a capital of $20,000, will manufacture electric water heaters by contract, confining the activities at this address to assembling the parts. It is receiving bids for the manufacture of those parts. Walter A. Dilzell is president of the company; O. P. Montagnet, vice-president; and A. Montagnet, secretary-treasurer.

The Highland View Mfg. Co., Marwood, Pa., recently incorporated, is starting the construction of a plant to manufacture wood and metal specialties. It is in the market for quantities of nickel steel, xylophone hammers and various tools; also for No. 1 tempered bell steel and piano wire of various gages. James Whewell is president.

The United Metal Box Co., 514-16 West Forty-sixth Street, New York, has been incorporated with a capital of $30,000 to manufacture metal containers, boxes, cutout cabinets and fireproof steel equipment. It is manufacturing at the above address, but purposes to erect a plant as soon as a site is decided upon. It is in the market for blue annealed sheets. The incorporators are D. Postal, S. Hammer and I. Klein.

The Norwalk Refrigerating Equipment Co., 35 Warren Street, New York, has been incorporated with a capital of $25,000 to manufacture refrigerating equipment and apparatus. Most of its manufacturing will be done by the Norwalk Iron Works Co., South Norwalk, Conn., while the new company, though a separate organization, will attend to sales and installation. Similar branch offices may be established in several large cities.

The Bay Ridge Polishing & Plating Co., 235 Forty-third Street, Brooklyn, has been incorporated with a capital of $10,000 to manufacture metal specialties and operate a general plating works. The incorporators are T. Collins, P. Larkin and C. Lynn.

The Radiaud Corporation, 94 Park Place, New York, has been incorporated with a capital of $20,000 to manufacture wireless equipment and parts. Its manufacturing will be let out to contract, leaving only the assembling to be done at the above location. The incorporators are E. H. Bronner, J. Perlmuth and E. A. Zadig.

The American Shipbuilding Co. and subsidiaries report for the year ended June 30 last gross income after manufacturing expenses of $1,369,757, as compared with $2,391,126 in the previous year, and a surplus after preferred dividends of $1,061,948, against $613,179 in the year ended June 30, 1921. M. E. Farr, president, stated before the stockholders that the plan to retire outstanding preferred stock with cash or equivalent was without success. A compromise was effected which resulted in the exchange of over 90 per cent of preferred for common shares.

PIG IRON PRICES EASIER

Finished Products, However, Are Firm in the Mahoning Valley

YOUNGSTOWN, Oct. 3.—Though various grades of pig iron are apparently easing in price, as compared with recent quotations, the steel market in general remains firm. Independents have well-filled order books for the rest of the year. The leading interest, like the independents, is handicapped by the scarcity of cars and is therefore unable to work off tonnage in such volume as would otherwise be done. Until mills are in better condition to meet the demand, the price structure will likely remain strong. As output approaches normal again and orders are worked off the books, an easing in prices may be expected.

Indicative of the current situation is the announcement by the Brier Hill Steel Co. that it has marked up sheet prices an average of $5 per ton above current minimums, establishing its prices at 2.75c for blue annealed, 3.75c for black and 4.75c for galvanized base gages. Its unfilled tonnage will be worked off, of course, at the old prices. Valley interests have considerable tonnages on their books accepted at the prevailing market minimums.

Active Plate Inquiry

Plate inquiry is active and tonnages are being placed, especially by builders of tanks and tank cars. Such interests have recently been in receipt of substantial orders. The Standard Tank Car Co. of Sharon, Pa., for instance, received last week an order from the Atlantic Coast Line Railroad for 2000 new box cars, announces President John Stevenson, Jr. This is in addition to an order for 700 box cars received by the company previously from the same source. The new order involves about $4,000,000. The company has unfilled orders on its books totalling $7,000,000, including car construction for the New York Central and the Erie railroads, it is officially stated.

The Pennsylvania Tank Car Co. and the Petroleum Iron Works are other concerns in the Sharon district operating at capacity, which were recently the recipients of substantial orders.

High Cost of Materials

High cost of coke is still a materially contributing factor in pig iron costs, especially where it is necessary to purchase beehive coke in the Connellsville region. Considering the poor quality of recent shipments, one Valley iron producer figures that supplies lately have cost it as much as $16 per ton, laid down in its yards. The market for beehive is firm at $12, at the ovens. Buyers fear that prices may reach yet higher levels owing to restricted output and demands of merchant stacks planning to resume.

The A. M. Byers Co., Pittsburgh, has lately offered surplus tonnages of foundry from its Girard, Ohio, furnace, at a reported price of $33 for No. 2 foundry. Among its bookings is one order involving 1000 tons.

Standard pipe demand is firm, say makers, especially in the smaller sizes used in construction. Makers still have a substantial backlog in buttweld pipe, but fairly prompt delivery is possible on the larger sizes. There has been somewhat less active demand lately for lapweld pipe from the oil fields, and marked by much irregularity. Producers have not yet received the benefit of the Aug. 15 price advance, which did not take into consideration higher costs arising from the wage increase effective Sept. 1. Hence there is some talk of another advance, which would likely have at this time the effect of stimulating releases and new business.

Merchant steel bars range from 2c to 2.25c. Several Valley interests are shipping to regular customers on new contracts signed at 1.85c, which represents a special adjustment. Old contracts carrying a price tag of 1.40c to 1.45c were changed, buyer and seller "splitting the difference" between the current market and the old prices involved.

Heavy melting scrap ranges from $22.50 to $23, while hydraulically compressed sheets are held at $21. Other grades of old metals are relatively high. Firmness in this market is due to the active demand on account of the higher operating rate of open hearth furnaces, and the fact that the railroads are not picking up scrap and making deliveries as usual on account of the car situation.

Producers of galvanized products, such as pipe and sheets, are now compelled to pay 6.85c per lb. for spelter, largely employed in the galvanizing process. This is fully 50 per cent above the post-war low of 4.125c.

Sheet bars have stabilized for the fourth quarter at $40. Slabs and billets carry the same price tag, but there is limited demand for these forms of semi-finished steel. In this territory sheet bars constitute the bulk of the semi-finished output.

TO PROMOTE SAFETY

Six Thousand Plants in New York Will Participate in the Campaign

More than 6000 industrial plants in New York employing close to 1,000,000 men and women will participate in the campaign for the prevention of accidents which will be launched during the week of Oct. 8 to 14 by the Safety Institute of America through the Public Safety Committee of which Elbert H. Gary is chairman. This announcement was made by Laurence Vail Coleman, director of the Safety Institute of America, following the appointment of Henry D. Sayer, commissioner of the New York State Department of Labor, as chairman of the Industrial Committee for the safety week campaign. In asking Commissioner Sayer to accept this post, Judge Gary wrote:

"We are sure you share the conviction of every progressive manager of industry that community safety has a vital bearing on industrial safety, that when workmen are reached in their homes they come back to the plants not only interested in safety as employees but believing in it as fathers and citizens.

"In the city-wide campaign the industries are each to be called upon to take advantage of the widespread community interest and to conduct an aggressive safety drive among their employees so that the workmen will not only work safely in the factory, but will also preach and practice safety in their homes and among their neighbors.

"During the 16 years of the safety movement in industry, we have demonstrated, as you are well aware, that 75 per cent of all deaths and serious injuries can be eliminated. I am convinced from my study of the experience of other large cities, that just as we have been able to so organize safety in a plant that the interest of every man is gripped, so it is possible to develop in New York an organized effort with sufficient influence and man power to conduct a year round campaign of education through the schools, the press, the industries and the various civic agencies that every man, woman and child of the six millions in our city will be reached.

"Knowing your wide acquaintance among the industrial managers of New York, and your recognized influence and leadership, I am certain that you will be able to secure the whole hearted co-operation of the industries in this city-wide drive to save human life."

In accepting the appointment, Mr. Sayer said:

"If New York's public safety campaign is as successful as industrial safety campaigns have been, there will be alive and happy in New York next Christmas hundreds of persons who would otherwise have been killed or crippled by accident. And, when one knows that the men back of New York's public safety campaign are practically all men who have had long contact with industrial accident prevention, one is certain of that success."

Machinery Markets and News of the Works

BUSINESS IS SPOTTY

Some Machine-Tool Companies Continue to Report Improvement

Others Say That September Sales Were Not Up to the Mark of Preceding Months

The outstanding impression gathered regarding current machine-tool trade is that it is decidedly spotty. While on the one hand some companies, particularly those specializing in railroad equipment, report that September business was the best of the year, other machine-tool sellers report quite the contrary. In at least a few instances September was the poorest month since the first signs of general improvement were noted a few months ago.

Prices continue to advance on many lines of tools, several leading companies having announced higher quotations within the past week.

Railroads are the most active buyers. The Chicago, Rock Island & Pacific has completed purchases totaling about $100,000 at Chicago. The Missouri-Kansas-Texas Railroad has closed at St. Louis for milling machines and shapers and other tools will probably be acted upon shortly. The Chicago, Milwaukee & St. Paul and the Southern Railroad have each purchased a number of tools. The Central of Georgia has a list out on which no action has yet been taken.

The Baldwin Locomotive Works has closed for practically all of the machines inquired for recently, totaling nearly 40. The McMyler-Interstate Co., Cleveland, which will engage in locomotive repair work, is understood to have completed fairly substantial machine-tool purchases.

In the industrial field the continued activity of the automobile industry is of outstanding interest. The Durant Motor Co. has work under way for its new plant at Flint, Mich., which will manufacture the Flint Six, and the Chevrolet Motor Co. and the Fisher Body Corporation are to build plants at Cincinnati, all of which will probably be buyers of machine tools. H. J. Walker, former president of the H. J. Walker Co., Cleveland, is lining up equipment for the manufacture of automobile parts.

The Hazel-Atlas Glass Co. was a buyer of about twelve tools for its Huntington, W. Va., plant. The Carnegie Steel Co. has inquired at Pittsburgh for ten woodworking and three metalworking machines for its Clairton, Pa., by-product coke plant.

New York

NEW YORK, Oct. 3.

A SLIGHT improvement in machine-tool sales was apparent the last week in September, but business is spotty and the betterment was not felt in all lines. The heavier tools, such as are required for railroad shops, are in much better demand than the lighter tools. The principal buying in the East the past week has been done by the General Electric Co., Schenectady, N. Y., and the Baldwin Locomotive Works, Philadelphia, each having purchased quite an extensive list of tools. The requirements of the General Electric Co. included 14 milling machines, turret lathes, drills, shapers, etc., while those of the Baldwin Locomotive Works were mostly in heavier machines for locomotive work. The Union Tank Car Line has bought a car wheel borer and an axle lathe.

The market in cranes in this district is dull despite activity elsewhere. While there have been some orders placed during the week, and there are a few pending, new inquiry is slack. There is some activity in locomotive cranes.

Among recent purchases are:

Barnet Weinstein, 53 Boerum Street, Brooklyn, N. Y., a 6-ton, 61-ft. span overhead traveling crane from the Pawling & Harnischfeger Co.

City Coal Co., Hartford, Conn., a 7-ton, crawl tread crane from the Orten & Steinbrenner Co.

Department of Public Works, Cleveland, a 10-ton crawl tread crane from the Northwest Engineering Co.

Manning Paper Co., Troy, N. Y., tramrail system of about 2000 ft. from the Cleveland Tramrail Co.

Phoenix Utility Co., 61 Broadway, New York, a 30-ton, 90-ft. boom, used, Ohio locomotive crane from Philip T. King, 30 Church Street, New York.

National Foundry Co., Brooklyn, N. Y., a 1000-ft. tramrail system from the Cleveland Tramrail Co.

Ideal Concrete Machine Co., Cincinnati, Ohio, a 10-ton, 37-ft. 2-in. span, used, Champion overhead traveling crane from the Industrial Equipment Co., 149 Broadway, New York.

City of Providence, R. I., two 5-ton, 90-ft. radius hammerhead type, revolving boom cranes for handling lumber from Heyl & Patterson, Inc.

A. C. Dutton Lumber Corporation, lessees Fields Point Lumber Storage Development, Providence, R. I., two 50-ton lumber-carrying portals from Heyl & Patterson, Inc.

Cambridge Cement Stone Co., Boston, a 5-ton, 43-ft. span, 3-motor, overhead traveling crane from the Northern Engineering Works.

Proctor & Schwartz, Philadelphia, a 3-ton, 52-ft. span electric traveling crane from the Northern Engineering Works.

Hillis & Sons, Ltd., Toronto, Ont., a 5-ton, 28-ft. span overhead traveling crane from the Northern Engineering Works.

Gilbert & Barker Mfg. Co., Springfield, Mass., two 1-ton, 25-ft. span, 2-motor, single I-beam cranes from the Shepard Electric Crane & Hoist Co.

Smith & McCrorken, Inc., Brooklyn, operating two local plants at 67 Engert Avenue and 45 Eckford Avenue for the manufacture of nails, spikes, etc., has acquired the two-

Frostholm Brothers, Syracuse, N. Y., tool manufacturers and cylinder grinders, have purchased a new daylight factory at 1009 South Clinton Street. The new equipment is being installed.

The New York Edison Co., 130 East Fifteenth Street, New York, will soon commence the construction of a new three-story power house, 44 x 123 ft., at 10-12 Stone Street, to cost in excess of $150,000. E. M. Van Norden is company engineer.

story machine shop and foundry of the Clark Electric Mfg. Co., 75 x 100 ft., at 22 Vanderbilt Avenue, for the establishment of a third plant for the production of brass, bronze and other metal castings.

The Consolidated Machine Tool Corporation, 17 East Forty-second Street, New York, has arranged for a new bond issue of $600,000, a portion of the proceeds to be used for extensions and improvements. Ground has been broken for a two-story foundry at the Hilles & Jones Co. division plant, Wilmington, Del. C. K. Lassiter is president.

A two-story automobile service and repair works, 155 x 205 ft., for company trucks and cars, estimated to cost about $200,000, with equipment, will be erected on White Plains Avenue, White Plains, N. Y., by the New York Telephone Co., 15 Dey Street, New York. McKenzie, Voorhees & Gmelin, 432 Madison Avenue, New York, are architects.

The Superior Ice Co., Inc., 50 East Forty-second Street, New York, has acquired property at East Seventeenth Street and Avenue Z, Sheepshead Bay, Brooklyn, for the erection of a new ice-manufacturing plant and cold storage department. All machinery will be electrically-driven. The estimated cost is $250,000. Waldemar Mortensen, 209 West Seventy-sixth Street, is engineer.

The Corn Products Refining Co., 17 Battery Place, New York, has arranged an appropriation of $3,000,000 for extensions at its refineries at Edgewater, N. J., Pekin and Argo, Ill., including the installation of additional machinery. It will also expand its foreign plants in France and Germany and expects to expend in excess of $1,000,000 for buildings and equipment.

The Utica Motor Car Co., Genesee Street, Utica, N. Y., has awarded contract to R. Richards & Son, 114 Elizabeth Street, for a top story and rear addition, 48 x 250 ft., to its service and repair works, estimated to cost about $100,000. A list of equipment is said to be in preparation.

The Benedict Stone Corporation, 33 West Forty-second Street, New York, manufacturer of steel-reinforced stone products, is perfecting plans for the establishment of a new plant at Chicago, to be operated by a subsidiary organization soon to be formed. An existing building will be equipped, or a new plant constructed. The company is arranging to increase its present capitalization of $300,000.

The Rubel Coal & Ice Corporation, Glenmore Avenue, Ozone Park, Brooklyn, has plans under way for a new two-story ice-manufacturing plant, 100 x 150 ft., estimated to cost $500,000, including machinery.

The Utica Heater Co., Lafayette Street, Utica, N. Y., has awarded contract to H. R. Beebee, Utica City National Bank Building, for a one-story building at its Whitesboro plant, 72 x 100 ft., estimated to cost about $100,000.

A vocational department will be installed in the new high school to be erected on Lake Avenue, Saratoga Springs, N. Y., estimated to cost about $400,000, for which bids recently received have been rejected. New bids will be called at an early date. Coffin & Coffin, 522 Fifth Avenue, New York, are architects and engineers.

The Mason Tire & Rubber Co., 233 West Fifty-eighth Street, New York, with main plant and headquarters at Kent, Ohio, has plans in progress for enlargement in its branch works at Bedford, Ohio, comprising the former plant of the Owen Tire & Rubber Co., recently acquired. A bond issue of $2,000,000 is being arranged. O. M. Mason is president.

The International Combustion Engineering Corporation, 43 Broad Street, New York, manufacturer of stokers, boiler house equipment, etc., has acquired the plant and business of the Green Engineering Co., East Chicago, Ind., manufacturer of similar equipment, with property totaling about 12 acres. It will be operated as a subsidiary. George E. Learnard is president of the purchasing company.

The United Last Co., 191 Worth Street, New York, has awarded contract to the Turner Construction Co., 242 Madison Avenue, for a new three-story plant, 80 x 130 ft., at Classon Avenue and Clifton Place, Brooklyn. It will cost close to $100,000 with machinery.

The American Machine & Foundry Co., 511 Fifth Avenue, New York, has called a special meeting of stockholders on Oct. 17 to increase the capital from $2,000,000 to $10,000,000, a portion of the proceeds to be used for extensions and improvements.

The Brooklyn Edison Co., 360 Pearl Street, Brooklyn, has awarded contracts for the construction of the prime movers for its new electric generating plant on Hudson Avenue, consisting of two turbo-generators, to cost about $1,500,000 each, one machine to be built by the General Electric Co., Schenectady, N. Y., and the other by the Westinghouse Electric & Mfg. Co., East Pittsburgh. Foundations for the plant are being laid and it is expected to be ready for service late in 1923. It will cost about $10,000,000.

The State Hospital Commission, Albany, N. Y., will soon take bids for a number of new buildings for the Brooklyn State Hospital, Creedmore Division, to include a one-story power house, 115 x 145 ft., with installation to include a 600-kw. generator, two 300-hp. and one 150-hp. engines, two blower engines, pumps, compressors and auxiliary machinery. L. F. Pilcher is State architect in charge.

The Public Service Electric Co., Public Service Terminal, Newark, will build a one-story addition to its Duffield Avenue power plant, Jersey City, to cost about $40,000.

The Arctic Ice & Coal Co., Summit, N. J., recently organized, has tentative plans for a new artificial ice-manufacturing plant. Robert J. Murphy and William McCue, 156 Park Avenue, head the company.

A vocational department will be installed in the proposed high school to be erected at Paulsboro, N. J., estimated to cost $150,000. A site is being selected.

The Paragon Can & Cap Co., 241 Thirty-seventh Street, Brooklyn, has leased the two-story building at 204-8 Clay Street, Paterson, N. J., totaling about 25,000 sq. ft., for the establishment of a new plant. Robert A. Russell is president.

H. M. Nelson, 248-68 Thomas Street, Newark, manufacturer of machinery and parts, has filed plans for a new one-story machine shop, 79 x 100 ft.

A cold storage plant will be installed in the new four-story warehouse, 50 x 100 ft., to be erected by Joseph J. Kroeger, 546-48 Central Avenue, Newark, N. J., as an addition to his present plant, estimated to cost $100,000. Moores & Dunford, 38 South Dearborn Street, Chicago, are engineers.

Chicago

CHICAGO, Oct. 2.

THE Chicago, Rock Island & Pacific has completed its machine tool purchases, which probably total close to $100,000. The Chicago, Burlington & Quincy has not yet taken action on its lists, and the Atchison, Topeka & Santa Fe still has about a dozen items on its old inquiry which have not yet been ordered. Business from general sources continues to improve slowly. Fairbanks-Morse & Co., have placed an order for a 60-in. engine lathe and a 72-in. engine lathe for its Beloit, Wis., plant. These are unusually large machines, seldom built for users in this district. The Pullman Co., which has been in the market for a 24-in. engine lathe, a 4-ft. radial drill, a 60-in. boring mill, a planer and an electric grinder for its Michigan City, Ind., plant, is understood to have bought second-hand equipment. The International Harvester Co. continues to buy tools from time to time for its local tractor plant. September total sales for local machinery houses which participated in recent railroad orders were larger, or at least as large, as in any previous month this year.

Prices continue to advance. The Lodge & Shipley Machine Tool Co. and the Bradford Machine Tool Co. have each advanced engine lathes about 15 per cent, while prices on Greaves-Klusman lathes are up 10 to 15 per cent. The Columbia Machine Tool Co. has advanced shapers 10 per cent. Radial drills are expected to go up from 10 to 15 per cent within 30 days.

The American Steel & Wire Co. is in the market for a constant speed belt-driven universal milling machine, with 50-in. longitudinal, 14-in. cross, and 20-in. vertical range, for its Anderson, Ind., plant.

The Chicago, Burlington & Quincy has placed the remainder of the cranes on its extensive inquiry with the Pawling & Harnischfeger Co. Two 15-ton gantry cranes are for the Eola scrap yard near Aurora, Ill. The other seven cranes are all for the new shop at Denver, Col. They comprise one 25-ton 3-motor 68-ft. span crane, one 25-ton 4-motor 68-ft. span crane, one 50-ton 5-motor 97-ft. 8-in. span crane, one 15-ton 3-motor 94-ft. 8¾-in. span crane, two 15-ton 3-motor 66-ft. 8-in. span cranes and one 10-ton 3-motor 84-ft. span crane.

The Pullman Co. has ordered the remainder of its crane equipment for its new carwheel foundry at Pullman, Ill., as follows: Two 7½-ton 4-motor 100-ft. span cranes to the Shaw Electric Crane Co.; and one 3-ton 59-ft. 3½-span crane, one 3-ton 25 ft. 3½-in. span crane, and three 1-ton special 3-motor wheel-fitting trolleys, with 8-ft. 8-in. span, to the Shepard Electric Crane & Hoist Co. The Pullman Co. also placed an order for a 15-ton reservoir ladle and a number of small ladles for its carwheel foundry with the Whiting Corporation. The latter company also has received an order

for a 24 x 48-in. tumbling barrel from the Williams-White Co., Moline, Ill.

The Gits Brothers Mfg. Co., manufacturer of automobile parts, 1941 South Kilbourn Avenue, Chicago, has let contract for one-story additions, 25 x 56 ft. and 94 x 150 ft., to cost $25,000.

Frank Gustafson, 5724 Kenmore Avenue, Chicago, has let contract for a one-story garage, 109 x 200 ft., at 405-423 East Erie Street, to cost $80,000.

The American Building Foundry Co., 2300 South Springfield Avenue, Chicago, has let contracts for a one-story addition, 35 x 93 ft., to cost $7,000.

The Central Illinois Public Service Co. has commenced the construction of a power plant at Grand Tower, Ill., to cost $6,000,000.

Fire recently damaged the plant of the Universal Truck Co., 1732 Kolmar Avenue, Chicago, as well as the adjoining structure of the Boss Nut Co.

A referendum recently held at Orange City, Iowa, showed a great majority in favor of the construction of a municipal light and power plant. The proposition to issue $45,000 in bonds for constructing the plant also carried.

The Reynolds Wire Co., Dixon, Ill., has let contract for a four-story addition, 150 x 150 ft., to cost $150,000.

S. G. Robbins, 140 North Dearborn Street, Chicago, has let contract for a one-story machine shop, at 4711-17 West Lake Street, to cost $35,000.

The Moore Battery Corporation, 14 South Wells Street, Chicago, recently incorporated with $2,500 capital stock, will manufacture automobile and radio batteries and will lease plant space from the Electric Service Construction Co., 10 South Wells Street. No metal-working equipment will be purchased at this time. The officers are P. C. Moore, president, and Marie Moore, vice-president and treasurer.

The Sure Seal Bottle Capper Co., 552 West Harrison Street, Chicago, recently incorporated, is a continuation of a partnership of the same name. It manufactures bottle-capping machines, wrenches, can-openers and other punch press products. There will be no change in the organization other than incorporating.

The Western Cartridge Co., East Alton, Ill., has awarded contract to the Wimmer Construction Co., Victoria Building, St. Louis, for a one-story addition, 85 x 240 ft., to its brass mill, estimated to cost $50,000.

The Copher Machine Mfg. Co., New Prague, Minn., has preliminary plans in progress for a new one-story machine shop, 60 x 100 ft. J. C. Niemeyer, St. Paul, Minn., is architect.

The Imperial Clock Co., Collinsville, Ill., is planning for the installation of precision lathes, drill presses, grinders, punch presses and other tools.

A vocational department will be installed in the new two-unit, three story high school to be erected at Evanston, Ill., estimated to cost in excess of $2,000,000, including equipment, for which bids will be called at an early date. Perkins, Fellows & Hamilton, 814 Tower Court, Chicago, are architects.

The Crystal Ice & Fuel Co., 110 North Washington Avenue, Danville, Ill., has plans under way for a new two-story plant, estimated to cost $50,000.

The Keystone Wire & Steel Co., South Bartonville, Ill., will commence the immediate erection of a one-story building, 220 x 280 ft., estimated to cost $55,000.

A vocational department will be installed in the new North High School to be erected at Thirty-first Street and Ames Avenue, Omaha, Neb., estimated to cost $500,000, for which bids on a general contract will soon be asked. John Latenser & Sons, 732 Peters Trust Building, are architects.

E. W. Nothstine, Liberty Building, Des Moines, Iowa, has awarded a contract to W. F. Kucharo, Hubbell Building, for a new six-story automobile service and repair building, 26 x 127 ft., at Chester and Fifth Streets, estimated to cost $300,000, including equipment.

The Kroeschell Brothers Co., 460 West Erie Street, Chicago, operating boiler, tank and plate works, and the Kroeschell Brothers Ice Machine Co., same address, an affiliated concern, manufacturer of ice and refrigerating machinery, are completing revised plans for a new one and two-story plant, 210 x 375 ft., on Diversey Avenue, to be used jointly by both companies, estimated to cost $300,000, including equipment. Davidson & Weiss, 53 West Jackson Boulevard, are architects.

The Western Light & Power Co., Boulder, Col., is planning for extensions and improvements in its Lafayette hydroelectric power plant, including the installation of additional machinery, to cost about $200,000. The Cheyenne, Wyo., plant will also be extended and improved, with cost estimated at $125,000. The company is operated by the Cities Service Co., 60 Wall Street, New York.

Buffalo

BUFFALO, Oct. 2.

THE King Electric Mfg. Co., 20 North Niagara Street, Tonawanda, N. Y., manufacturer of battery equipment, electric charging devices, etc., has taken over the building at 1671-75 Fillmore Avenue, Buffalo, for a new plant. The Tonawanda works will be removed to the new location.

Fire, Sept. 25, destroyed a portion of the plant of the Auto Wheel Coaster Co., North Tonawanda, N. Y., manufacturer of toy automobile equipment, etc., with loss estimated at $25,000. It will be rebuilt at once.

The Niagara, Lockport & Ontario Power Co., Lockport, N. Y., is disposing of a block of preferred stock, the proceeds to be used in part for extensions and improvements.

The controlling interest in the 1900 Washer Co., Binghamton, N. Y., manufacturer of electrically-operated washing machines, has been acquired by the Binghamton Washing Machine Corporation, organized under State laws with a capital of $800,000. The new owner will take immediate possession of the plant and proposes to increase the output. The purchasing company is controlled by the Maynard H. Murch Co., Union National Bank Building, Cleveland, investment securities, and Walter S. Quinlan, vice-president and secretary of the latter company, will be president of the new organization; T. W. Behan, formerly general manager of the 1900 Washer Co., will be vice-president, and Paul J. Bickel, secretary.

Following the completion of its addition, representing an investment of $250,000, the J. Spaulding & Sons Co., 484 Broome Street, New York, manufacturer of fiber products, will build another addition to its plant on Wheeler Street, Tonawanda, N. Y., estimated to cost about $150,000, including machinery. Plans are being drawn and it is expected to have the structure ready for occupancy in the spring. George F. Hardy, 309 Broadway, N. Y, is engineer.

The Burdick-Atkinson Co., Hamburg, N. Y., manufacturer of steel wire springs, etc., is arranging for the installation of machinery at its new plant on Scott Street. J. S. Burdick is president and general manager.

The Skelton Shovel Co., Hamilton, Ont., has awarded contract to the Trid Construction Co., Hamilton, for its proposed plant on East Lake Road, Dunkirk, N. Y., estimated to cost about $100,000, with machinery. W. E. Skelton is president.

The Western New York Utilities Co., Main Street, Medina, N. Y., is disposing of a bond issue of $600,000, a portion of the proceeds to be used for extensions and improvements. C. S. Swett is vice-president.

The National Roofing Co., Fillmore Street, Tonawanda, N. Y., has acquired property at Chattanooga, Tenn., for the erection of a new plant, estimated to cost about $350,000, including machinery.

The Aldrich Paper Co., Gouverneur, N. Y., has preliminary plans under way for a new plant to cost about $40,000. N. R. Caswell, First National Bank Building, is head.

The Pittsburgh & Freeport Coal Co., Bank of Jamestown Building, Jamestown, N. Y., will install new coal-handling machinery at its plant on Institute Street, now in course of erection.

Detroit

DETROIT, Oct. 2.

THE closing week in September fulfilled the predictions of machinery representatives and inquiries and actual business for the month fell considerably below the volume for any of the three months previous. There is a feeling of optimism, however, the latter part of the week developing prospective business for October and the last quarter. This has been more in the nature of statements by manufacturers of their probable needs rather than inquiries. Several representatives report manufacturers are asking for quotations to be optional until Oct. 15 with the privilege of specifying delivery from that date until Dec. 15. They are showing a desire to be protected at present prices on the machinery necessary for their production schedules beginning the first of the year.

Supplementing the recent announcement of Durant Motors, ground was broken Aug. 30 for the first group of factory buildings of the Flint Motor Co., Flint, Mich. The buildings, including seven units, will provide 579,925 sq. ft. of floor space. Construction work is being done by the Christman Construction Co., which recently completed the

plant of the Durant Motor Co. of Michigan at Lansing. The contract requires that the buildings shall be ready for production by March 1, 1923.

The Detroit Foundry Co., through Frank L. Bromley, president, announces that it has leased, with the privilege of purchase, the foundry of the American Blower Co., which discontinued the operation of its Detroit foundry about a year ago after purchasing the former plant of the Lane & Bodley Co., Cincinnati. This will provide the Detroit Foundry Co. with about twice the floor space of its present plant on East Grand Boulevard. The present plan is to operate both plants, although operations may later be consolidated in the larger foundry.

The Butt Welding & Mfg. Co., 4847 Bellevue Avenue, Detroit, has been reorganized as the Butt Welding Co. with the following officers: Charles A. Dunn, president; Earl M. Porter, vice-president; Ezra C. Wing, secretary; Percy C. Chesterfield, treasurer.

The Federal Pattern Co., manufacturer of wood and metal patterns, 8741 Kercheval Avenue, Detroit, has been incorporated for $5,000 with the following officers: B. M. Uhlig, president; E. F. Wunsch, vice-president; J. Louis Horn, secretary and treasurer. It has been operating since the early part of the year and plans in the near future to add foundry and machine supplies to its line of products.

The Hupp Motor Car Corporation, 3501 East Milwaukee Street, Detroit, has awarded contract to the Everett-Winters Co., Book Building, for three four-story and one one-story addition to its plant on Griffin and Moran Streets. Two of the four-story plants will cost $500,000, with equipment, and the other, $175,000; the one-story structure will be used in connection with the power house and will cost about $15,000.

The Chevrolet Motor Co., 3044 West Grand Boulevard, Detroit, has purchased about 29 acres at East Delavan Avenue and the Erie Railroad, Buffalo, and has plans in progress for new works, with aggregate floor area of 400,000 sq. ft., including machine shop, forge shop, assembling department, testing shop, power house, etc. On the same tract, the Fisher Body Co., Detroit, an affiliated organization, will build a new plant for body manufacture for Chevrolet cars, to total about 200,000 sq. ft. of floor space, for a daily output of 500 bodies. A similar project will be carried out by the two companies at Cincinnati, where property has been acquired in the Norwood section.

The Board of Directors, Detroit Municipal Tuberculosis Sanatorium, 1415 St. Antoine Street, Detroit, is taking bids until Oct. 9 for a conveyor system, elevating equipment, coal hoppers, bins, etc., for the power house at the institution, Northville, Mich. Stratton & Snyder, Union Trust Building, are architects.

The Pennsylvania Railroad, Penobscot Building, Detroit, will commence the erection of a new engine house, 60 x 210 ft., with repair department, at Ecorse, Mich.

A vocational department will be installed in the new two-story high school to be erected at Coleman, Mich., estimated to cost $110,000. The Warren S. Holmes Co., Lansing, Mich., is architect.

Philadelphia

PHILADELPHIA, Oct. 2.

THE Pennsylvania Railroad Co., Broad Street Station, Philadelphia, will soon commence the erection of new car shops at Pitcairn, Pa., to consist of a main one-story, steel freight car repair works, 100 x 750 ft.; one-story air-brake shop, 60 x 105 ft.; one-story paint shop, 103 x 425 ft., with oven department; oil house, oxygen and acetylene building, and other structures, estimated to cost close to $500,000, including equipment. A. C. Shand is chief engineer.

The addition to be erected at the plant of the General Electric Co., Witherspoon Building, Philadelphia, at Seventh and Willow Streets, 140 x 175 ft., will be used for the manufacture of electric switches and kindred specialties. Bids for construction are being taken.

Humphreys & Co., Philadelphia, operating structural steel and iron works at Front and Tusculum Streets, are taking bids for a new two-story plant.

The Paper Manufacturers' Co., 526 Cherry Street, Philadelphia, has commenced clearing the site at Fifth, Willow and Randolph Streets for a new five-story plant, for which plans are being completed. Clarence C. Wunder, 1415 Locust Street, is architect. Francis A. O'Neill is president.

Harper & Harper, 304 North Broad Street, Philadelphia, local representatives for the Hupmobile, have arranged for the establishment of a new parts and service department in the building at 625-35 North Watts Street. The installation will also include a body repair department, paint and trim works.

The Air Reduction Sales Co., Germantown and Allegheny Avenues, Philadelphia, manufacturer of oxygen and acetylene welding equipment, etc., will commence the immediate erection of a one-story addition.

The Philadelphia Electric Co., Tenth and Chestnut Streets, Philadelphia, has construction under way on the superstructure for a new two-story and basement power house, 60 x 120 ft. W. C. Elgin is chief engineer.

Mahlow & Wycoff, Brunswick Avenue and the East Trenton Railway, Trenton, N. J., machinists, have tentative plans for expansion for the manufacture of special coal-delivery bodies for Ford automobiles. The light-weight steel dump body now being produced in one size, will be developed in a number of larger sizes, with power hoists, for use on other type car chassis.

The Eastern Foundry Co., Boyertown, Pa., is completing plans for a new one and two-story pipe foundry, 100 x 150 ft. A. S. Kepner, 121 Hanover Street, Pottstown, Pa., is architect. E. M. Rhoads is president.

A vocational department will be installed in the high school to be erected on the Park Boulevard, Camden, N. J., estimated to cost $450,000, for which Clyde S. Adams, 2038 Spruce Street, Philadelphia, architect, will prepare plans.

The Penn Central Light & Power Co., 1809 Union Avenue, Altoona, Pa., is planning for extensions and improvements in its plant and system to cost about $165,000. Bonds are being arranged.

A vocational department will be installed in the new two-story and basement high school to be erected at Ashland, Pa., estimated to cost $125,000. Hersh & Sholler, Commerce Building, are architects.

The American Wire Fabrics Corporation, Mount Wolf, Pa., with branch plant at Blue Island, Ill., a subsidiary of the Wickwire-Spencer Steel Corporation, Worcester, Mass., has arranged for a bond issue of $1,500,000, a portion of the proceeds to be used for extensions and improvements.

The Pennsylvania Power & Light Co., Allentown, Pa., has acquired the Jersey Shore Electric Co. with other electric light and power plants and has arranged for a bond issue of $7,000,000, a portion of the fund to be used for extensions and improvements and the installation of new machinery. The purchasing company is operated by the Electric Bond & Share Co., 71 Broadway, New York.

The Ideal Dust Conveyor Co., Williamsport, Pa., has plans under way for the construction of a new plant to manufacture a patented metal dust conveyor. H. S. Schmidt is head.

A vocational department will be installed in the new two-story high school to be erected at New Holland, Pa., estimated to cost $100,000. Clifford Townsley, New Holland, care of the New Holland School Board, is architect.

The Pine Hill Collieries Co., Minersville, Pa., has arranged for a bond issue of $1,750,000, a portion of the proceeds to be used for improvements and the installation of mechanical and electrical equipment. Clarence B. Sturges is president. Headquarters are at 17 Battery Place, New York.

A manual training and vocational department will be installed in the new high school to be erected in the Washington Heights section, Morrisville, Pa., for which plans are now being prepared.

New England

BOSTON, Oct. 2.

SEPTEMBER closed with a moderate spurt of buying. Sales of both new and used equipment involved no large lists, but the number of individual orders probably was larger than for any previous period this year and represented buying from a wide diversity of maunfacturing interests. Many tools purchased were under negotiation for weeks. In addition, there is a noticeable increase in the number of inquiries, none of which is large.

Among sales was one of about 10 special new lathes to a Massachusetts machinery builder; six new upright drills to a Framingham, Mass., concern; a used Cameron punch and shear with a 48 in. throat, motor driven, to a New Jersey concern; a used 36-in. motor driven Cincinnati planer to a Syracuse manufacturing interest, and five miscellaneous new and used machine shop tools to a Providence interest, as well as additional equipment for trade school purposes. Other sales included gear cutting, motor-driven grinders, drill, lathe, threading and milling machines.

Bolt and nut makers are inquiring for rotary millers, screw machine product firms for slotting machines, tapping and threading tools; tap and die makers for lathes and special machines; textile machinery makers for drill and

planing equipment; stone working and electrical and textile machinery makers for cranes, railroads for lathes and shapers; electrical equipment manufacturers for special machinery, and general machine shops for a variety of tools, largely lathes.

A Vermont maker of stone cutting machinery has received an order from a Maine firm, involving lathes costing $18,000 to $20,000 each, and large planers.

A Western maker of drills advanced all machines above 20 in. 10 per cent, effective Oct. 1.

The Winter Brothers Co., Wrentham, Mass., taps and dies, contemplates an addition to its plant, but details have not been worked out. The company is six to eight weeks behind on deliveries and the plant is being operated 10 and 11 hr. per day.

The Reliance Machine & Specialty Co., oilless bushings, formerly located in Boston, but more recently in Fitchburg, Mass., is occupying quarters at the plant of the National Machine & Tool Co., 250 A Street, South Boston.

The Champion International Paper Co. contemplates the erection of a one-story, 62 x 112 ft. machine shop on Prospect Street, Lawrence, Mass.

The General Electric Co., West Lynn, Mass., has awarded contract for a four-story, 157 x 220 ft. addition to building No. 63.

The Fall River Water Department, Fall River, Mass., has awarded contract for the erection of a two-story machine shop and administration building.

The C. H. Tenney Co., 201 Devonshire Street, Boston, is the engineer on a power house to be erected for the Springfield Gas Light Co., Springfield, Mass., the contract having been let.

The Pruven Composition Products Co., a Delaware corporation capitalized at $250,000 to manufacture a substitute for hard rubber, has remodeled the recently purchased Askan Rubber Co., Milford, Conn. Considerable new machinery and other equipment will be installed.

The Colvin Foundry Co., Globe Street, Providence, has awarded a contract to the C. I. Bigney Construction Co., 357 Westminster Street, for a one-story addition, 100 x 100 ft.

The B. C. Ames Co., Waltham, Mass., manufacturer of lathes and metal-working machinery, has acquired an interest in the Triplex Machine Tool Corporation, 18 East Forty-first Street, New York, and will use the Waltham works for the production of different Triplex tools, including combination lathes, drill press, and milling machine. The Triplex company will continue to maintain headquarters at the present location.

An electrically operated pumping plant to cost about $125,000 will be constructed by the Board of Water Commissioners, Auburn, Me., for the local waterworks. Sawyer & Bean, 11 Lisbon Street, Lewiston, Me., are engineers.

The Electrical Appliance Mfg. Co., Waterbury, Conn., is perfecting plans for considerable increase in production. It recently increased its capital to $100,000.

William K. Brown & Son, 420 Central Street, Winchendon, Mass., have plans under way for a new one-story power house, 36 x 50 ft.

A vocational department will be installed in the new two-story high school, 104 x 250 ft., to be erected at Easthampton, Mass., estimated to cost $250,000. R. B. Warner and P. B. Johnson, 310 Main Street, Springfield, Mass., are architects.

The Supply Officer, Navy Department, Navy Yard, Boston, will take bids at once for one marine tilting furnace, two blacksmiths' forges and one portable oven, specified in engineering requisition 86.

The Cambridge Cement Stone Co., 156 Lincoln Street, Boston, will commence the immediate erection of a new plant to cost $25,000.

The Atlantic Refining Co., Hospital Trust Building, Providence, has plans under way for a new receiving and distributing plant in the Kettle Point district, including pumping plant, steel tanks, automobile service and repair building, etc., estimated to cost close to $75,000.

The Cheshire Mfg. Co., West Cheshire, Conn., has been organized by F. Cranston Thomas and associates to operate a plant adjoining the Connecticut Brass Works, recently acquired, for the manufacture of wireless equipment and devices and other electrical specialties. Improvements will be made in the existing building to cost about $50,000. George A. E. Jones, United States Electrical Co., New London, Conn., is interested in the new company.

The Edison Electric Illuminating Co., 70 State Street, Boston, will build a new one-story power house, 51 x 60 ft., on Spring Street, Watertown, Mass.

The Kopp & Sandel Co., 69 Conant Street, Roxbury, Mass., manufacturer of sheet-metal products, is planning for the installation of additional equipment.

Cincinnati

CINCINNATI, Oct. 2.

RAILROAD buying featured the machinery market the past week. The Missouri-Kansas-Texas Railroad closed on its list of milling machines and shapers and other miscellaneous tools are now under negotiation. The Rock Island continues to place orders, taking nine lathes from one manufacturer, while the Chicago, Milwaukee & St. Paul, in addition to purchasing a number of slightly used tools, has placed orders for several new machines. The Burlington is expected to close on a fairly sizable list shortly. The Southern Railroad bought seven tools. No action has been taken on the list of the Central of Georgia. Industrial buying is showing a steady improvement. The largest order received from this source came from the Gulf Refining Co., reported last week as having bought seven machines. Later information places the total of this company's purchases at 28. A local manufacturer booked an order for three gear hobbers from an Eastern manufacturer and reports that the number of single inquiries received during the week is the largest for any week since 1920. The Dayton Engineering Laboratories Co., Dayton, Ohio, bought six 6-spindle drills last week. Many outstanding inquiries are being closed, though these are mostly for single machines. The Jeffrey Mfg. Co., which recently installed a battery of gear cutters, is understood to be contemplating additional equipment. The Chevrolet Motor Car Co., which is contemplating building an assembling plant at Cincinnati, is one of the leading prospects for future business. In connection with this, it is understood that the Fisher Body Corporation will also erect a large plant adjoining that of the Chevrolet plant. Plans of the two companies, reported last week as preparing to engage in locomotive repair work, have not been completed.

The Lodge & Shipley Machine Tool Co., Cincinnati, has advanced its line of lathes 15 per cent, effective Sept. 26, and the Cincinnati Planer Co. on Sept. 29 announced an advance of 10 per cent in its vertical boring and turning mills.

The Ohio Kennedy Co., Springfield, Ohio, has been incorporated with a capitalization of $10,000 to manufacture blow torches. The plant will be located at South Spring Street. George Cugley is president.

The plant of the Fairfield Engineering Co., Lancaster, Ohio, manufacturer of coal-loading machinery, was practically destroyed by fire on Sept. 25. The plant of the Carbon Products Co., adjoining, was also destroyed. The loss will amount to $250,000.

The Axton-Fisher Tobacco Co., 811 South Twentieth Street, Louisville, Ky., will build a second factory adjoining its present plant. It will be five stories with 60,000 sq. ft. of floor space. The cost, including equipment, will approximate $150,000.

The Indiana Borden Cabinet Co., Borden, Ind., has been incorporated with a capitalization of $100,000 to take over the plant of the Borden Cabinet Co. Harry B. Payne is the principal incorporator.

The plant of the Whitmore Handle Co., Mt. Vernon, Ind., was destroyed by fire Sept. 25, causing a loss of $25,000. It will be rebuilt immediately.

The Portsmouth Street Railway & Light Co., Portsmouth, Ohio, will make additions to its power plant at New Boston, buildings and equipment involving an expenditure of approximately $500,000. Preliminary work has commenced. Raymond D. York is president.

The Asheville Fireproof Co., Asheville, Ohio, has been incorporated with a capitalization of $30,000 to manufacture tile, hollow blocks, paving and building bricks, etc. It will erect a plant at Bell Siding, Ohio, which it expects to have in operation about Jan. 1. John Dum is president.

The Chevrolet Motor Co. has purchased 16 acres in Norwood, Ohio, on which it is proposed to build a plant for the production of Chevrolet cars to supply the Southern market. According to W. S. Knudsen, vice-president in charge of operations, the Norwood buildings will have 200,000 sq. ft. of floor space for the production of Chevrolet cars, and 150,000 sq. ft. devoted to the production of Fisher bodies. Production will run up to 300 cars daily.

Changes have been made in the plans of the new plant of the J. A. Fay & Egan Co. which it is estimated will effect a saving of $100,000 in construction costs. The building will

be 60 ft. shorter than originally contemplated, leaving the dimensions of the main plant 390 x 480 ft. Wood block flooring will also be omitted, as well as many of the plumbing features originally contemplated. Contractors who submitted bids on the original plans have been asked to file new proposals.

Pittsburgh

PITTSBURGH, Oct. 2.

MACHINE-TOOL business in this district continues dull as far as sales are concerned, but there still is a very fair inquiry and the trade is hopeful of the future. The Hazel-Atlas Glass Co. recently closed for six Hendey lathes, one Brown & Sharpe miller, one Cochrane-Bly cold saw, one Gould & Eberhardt shaper and three Reed & Prentiss drills. These tools are for the Washington, Pa., plant of the Hazel-Atlas Company, and are largely duplications of the machines that the company now is using. The Carnegie Steel Co. has put out a list of 13 tools for its Clairton, Pa., by-product plant. The list contains 10 wood-working machines, a drill press, pipe machine and grinder. A Pittsburgh maker of nuts and bolts has put out a list of five tools. Inquiries for single tools are fairly numerous. An advance of 15 per cent in Bradford lathes is reported, but no other price changes have been noted. The market on heavy equipment has quieted since the recent purchases by the Otis Steel Co., Cleveland, and Weirton Steel Co., Weirton, W. Va., against additions to those plants. However, the amount of pending business, notably in cranes, still is large and official announcement of the plans of the company which will build an 8-unit sheet mill plant in Detroit is awaited with considerable interest. The Lima Corporation, Lima, Ohio, has placed another 10-ton crane with the Shaw Crane Works, Muskegon, Mich. The Center Foundry & Machine Co., Wheeling, W. Va., has bought a 10-ton, 2-motor trolley from the Northern Engineering Works.

The Hanlon-Gregory Galvanizing Co., Pittsburgh, has filed an application for a permit to erect a brick manufacturing building on Butler Street, at a cost of $65,000.

The Titusville Iron Works, South Franklin Street, Titusville, Pa., manufacturer of engines, pumps, etc., has preliminary plans for an addition on South Washington Street, estimated to cost in excess of $125,000, including equipment.

Fire, Sept. 24, destroyed a portion of the plant of the Berney-Bond Glass Co., Clarion, Pa., with loss estimated at $100,000, including machinery. It is planned to rebuild.

The West Penn Power Co., West Penn Building, Pittsburgh, has plans nearing completion for a new power plant at Charleroi, Pa., to cost about $400,000 with equipment. Through its subsidiary, the Western Maryland Power Co., the West Penn company has acquired the municipal electric light and power plant at Oakland, Md., assuming control Oct. 1. Extensions and improvements will be made.

A one-story power house, 36 x 40 ft., and two-story tank house, 30 x 105 ft., will be erected by the Chesebrough Mfg. Co., 17 State Street, New York, manufacturer of vaseline products, in connection with its new plant at McKees Rocks, Pa., estimated to cost $750,000, with machinery.

The De Roth Steel Truck & Car Wheel Co., 611 Keystone Building, Pittsburgh, will soon break ground for the first unit of its new plant at Osgood, Pa., estimated to cost approximately $1,000,000, including equipment. A housing development for employees will also be carried out. C. Edward Long, 1202 People's Bank Building, Pittsburgh, is engineer; John D. Roth is president.

The Clarion River Power Co., Johnstown, Pa., has been granted permission to construct and operate a hydroelectric power plant at Piney Creek, Clarion River, estimated to cost $3,000,000. The company is affiliated with the Penn Public Service Co., Johnstown. F. T. Hepburn is president of both organizations.

A vocational department will be installed in the new three-story high school to be erected at Johnstown, Pa., estimated to cost $350,000, for which bids on a general contract are being received until Oct. 9. J. E. Adams, Nemo Building, is architect.

The Nitro Pencil Co., Nitro, W. Va., has plans under consideration for rebuilding its plant, including power house and other departments, destroyed by fire, Sept. 21, with loss estimated at $100,000, including machinery.

The Elm Grove Coal Co., Elm Grove, near Wheeling, W. Va., has plans nearing completion for a new steel tipple at its No. 1 mine.

Milwaukee

MILWAUKEE, Oct. 2.

FROM the standpoint of manufacturers of milling machines, September sales usually are reported to have been the best of the year and production made another small but encouraging advance over the previous month. Business on books and in sight for October shipment indicates that this month will again show a comparative increase. In most other lines of machine-tools, September business was an improvement over July and August. Automotive industries are still ordering single tools or small lots. Inquiry in the past 10 days indicates a broadening market, with railroad needs occupying a preeminent place. Business closed so far has not represented a great amount of railroad buying in favor of local manufacturers and dealers, but prospects are considered good. Metal-working industries in Milwaukee and throughout Wisconsin are optimistic now that the widespread labor troubles appear out of the way.

Considerable re-tooling of the works of the Samson Tractor Co. at Janesville, Wis., is in prospect as the result of the decision of the General Motors Corporation to liquidate its tractor business and convert the Janesville plant into a passenger car manufacturing group for the benefit of the Chevrolet division. The Samson works at Janesville represent an approximate investment of $4,500,000 and consist of a gray iron foundry, several machine shops, a steam generating plant, and auxiliary buildings. It is reported that the plant of the Janesville Machine Co., manufacturer of horse-drawn farm implements, and the foundry of the Waukesha Malleable Iron Co., affiliated with the Janesville group, will be disposed of by the General Motors Corporation. James A. Craig is general manager at Janesville.

The Allis-Chalmers Mfg. Co., Milwaukee, will soon be in the market for some additional machine-tool equipment for the tractor division of its main works in West Allis. The company is erecting a new building, 175 x 400 ft., at West Allis, to be ready about Jan. 1. Upon its completion this extension will accommodate the flour mill and sawmill machinery departments now occupying the Reliance works in Milwaukee, and a considerable number of other departmental production activities of various divisions. The extension now under construction will require considerable new equipment to supplement the present equipment of the various departments which will be transferred to it at the end of this year.

The Mound City Mfg. Co., Platteville, Wis., has completed a new machine shop, 40 x 80 ft., which is being equipped for the production of lawn-mowers, horticultural implements and tools. Most of the tool needs have been filled, although additional purchases will be made from time to time.

The Lux Fibre Furniture Co., 821 Meadow Street, Waukesha, Wis., has let contract to C. A. Dailey & Son, 202 Randall Street, local, for building a one-story brick and steel engine room, boiler house, service shop and garage, 45 x 90 ft., estimated to cost $25,000. Equipment is being purchased. Herman J. Esser, 82 Wisconsin Street, Milwaukee, is the architect.

The Fort Atkinson, Wis., Water, Light and Gas Commission, W. D. Leonard, superintendent, is asking bids until Oct. 11 for one 1000-gal. motor and engine-driven centrifugal pump, one 300-gal. motor-driven centrifugal pump, drilling of two new wells, and construction of 1600 ft. of 6-in. and 1400 ft. of 10-in. class C water pipe, for extensions of the municipal waterworks system.

The Fairmount Creamery Co., 200 North Broadway, Green Bay, Wis., will let contracts this week for an addition and power house, 100 x 115 ft., designed by Foeller, Schober & Stephenson, local architects. Inquiry is being made for additional generating equipment, ice machine, boilers, etc.

The Chippewa Valley Auto Co., 16 River Street, Chippewa Falls, Wis., is taking bids through E. J. Hancock, architect, Eau Claire, Wis., for a two-story sales and service building, 124 x 132 ft., estimated to cost $125,000. Fred A. Bigler is president and general manager.

The Superior, Wis., Board of Education is asking bids until Oct. 17 for the new East End high school in Allouez, estimated to cost $250,000. It will be 125 x 256 ft., two stories and basement and have vocational training facilities. L. A. Nichols is secretary of the board.

The Phenix Cheese Co., Plymouth, Wis., is in the market for two 150-hp. boilers, a steam generating unit, a 30-ton artificial ice machine and other equipment for a five-story brick and concrete plant and cold storage warehouse, 45 x 65 ft. The design, construction and equipment engineering is in charge of the Singer-Peristein Co., 9 South Clinton Street, Chicago. R. A. Harbach is general manager of the Phenix company.

The Rockwell Mfg. Co., 572 Park Street, Milwaukee, has let the general contract to the Arthur Breest Co., local, for a one-story addition, 54 x 200 ft., requiring considerable new equipment for production of millwork, interior furniture, and hardwood specialties. It will cost about $100,000. George Zagel & Brother are the architects.

The Milwaukee Woven Wire Works, 3014 Clark Street, has broken ground for a three-story factory and warehouse addition, 131 x 138 ft., adjoining the present plant. The bulk of new equipment needs are yet to be placed. The investment in building and machinery will be about $80,000.

The Gillett, Wis., Board of Education let the general contract to the Hoeppner-Bartlett Co., Eau Claire, Wis., for a new high school and manual training building, estimated to cost $125,000 complete. The architects are Oppenhamer & Obel, Wausau, Wis.

The Six-Wheel Truck Co., Fox Lake, Wis., contemplates engaging in commercial production of its new design of six-wheeler motor truck and will build a factory, about 40 x 100 ft., during the winter. F. N. Pettigrew is president.

The Thompson Brothers Boat Co., Peshtigo, Wis., has started work on a $50,000 factory addition, three stories, 60 x 120 ft.

The Viroqua, Wis., Board of Education has engaged E. J. Hancock, architect, Eau Claire, Wis., to design a new $200,000 high school and continuation institute to be erected early in 1923. C. F. Dahl is president of the board.

The Nickerbocker Novelty Co., Janesville, Wis., is a new $25,000 corporation formed by M. A. McQuaid, T. J. Griffin and J. E. Gross, Jr., to manufacture metal specialties and novelties. A plant will be leased at once.

The Wisconsin Regrinding Co., Sheboygan Falls and Fond du Lac, Wis., has started work on a one-story machine shop, 40 x 80 ft., at Anderson and Davenport Streets, Rhinelander, Wis., where a branch is being established under the management of Roy Nichols, vice-president.

The F. J. Greene Engineering Works, 1028 Douglas Avenue, Racine, Wis., has engaged Edmund B. Funston & Co., architects, local, to design a three-story brick, concrete and steel machine and assembling shop addition, 53 x 103 ft., estimated to cost $50,000.

The Acme Brass & Metal Works, Waupaca, Wis., has been organized with $75,000 capital stock to manufacture brass and metal castings and products. The principals are B. C. Koepke, Louis Larson and J. M. Braum, all of Waupaca. It is understood that an existing brass foundry and machine shop will be taken over immediately and operations resumed shortly after Oct. 1.

The Woodwork Mfg. Co., 1218 Twenty-third Avenue, Milwaukee, will build a two-story brick and concrete manufacturing addition, 50 x 97 ft., and install additional equipment, the whole to cost about $45,000.

The Ajax Auto Products Co., Racine, Wis., manufacturer of lifting jacks and similar automotive specialties, will erect an addition to cost about $20,000 with equipment.

The August C. Beck Co., Milwaukee, manufacturer of boxes, shooks, etc., sustained an estimated loss of $220,000 by fire which virtually destroyed its factories and equipment on Sept. 20. As soon as adjustment of the loss is completed a new factory will be erected. Ernest E. Fair is secretary and treasurer.

Indiana

INDIANAPOLIS, Oct. 2.

THE White Valley Power Co., a subsidiary of the Indiana Power Co., Indianapolis, has acquired the plant and system of the Oakland City Light & Power Co., Oakland, Ind., and plans for extensions and improvements. Negotiations are also being concluded for the purchase of the plant of the Princeton Light & Power Co., Princeton, which will be enlarged.

A vocational department will be installed in the new high school to be erected at Marion, Ind., two-stories, estimated to cost $200,000, for which bids on revised plans will be called at an early date. Harry G. Bowstead, 410 Glass Building, is architect.

The Whitmore Handle Co., Mt. Vernon, Ind., manufacturer of turned wood products, has tentative plans for rebuilding the portion of its plant destroyed by fire Sept. 25, with loss estimated at $30,000, including equipment.

The Pullman Co., Pullman Building, Chicago, is completing foundations for the addition to its foundry at Michigan City, Ind., and will commence superstructure work at once. A new power plant will also be erected. The work is estimated to cost about $500,000, including machinery. Frank D. Chase, Inc., 545 North Michigan Avenue, Chicago, is engineer.

The Wabash Valley Electric Co., Clinton, Ind., will make extensions and improvements in its plant and system, including the installation of additional equipment, estimated to cost $50,000.

An electrically-operated pumping plant will be installed in connection with the new waterworks to be constructed at Bloomington, Ind., estimated to cost in excess of $1,000,000. The City Council has authorized the employment of an engineer to prepare plans.

The Universal Burner Co., Logansport, Ind., recently organized to establish a plant to manufacture oil-burning equipment, is planning to purchase motors, air compressors, pumps and other equipment. Allen Nelson, Logansport, is head.

The Board of Works, Laporte, Ind., will make extensions and improvements in the municipal waterworks, including pumping plant and other departments, with the installation of additional equipment, estimated to cost $125,000. J. H. Harding is superintendent.

Baltimore

BALTIMORE, Oct. 2.

CONSTRUCTION of a new engine and repair shop by the Atlantic Coast Line Railroad Co., Wilmington, N. C., will commence at Southover Junction, Savannah, Ga., to cost about $100,000.

A vocational department will be installed in the new junior high school to be erected at Gynns Falls Park, Baltimore, estimated to cost $500,000 for which bids on a general contract will be called soon. Smith & May, Calver Building, are architects.

D. C. Elpinstone, 408 Continental Building, Baltimore, machinery dealer, has inquiries out for a locomotive crane for handling a 2-cu.-yd. clam shell bucket.

The Purchasing Agent, Post Office Department, Washington, will receive the following bids: Until Oct. 11, for 864 dozen hack saw blades, 12-in. long and ½-in. wide; until Oct. 13, for one squirrel cage electric motor, three-phase, 220-volt; until Oct. 9, for six preheaters, gas fuel, oven type; until Oct. 13, for 4000 hub brake shoes complete with springs for Ford trucks; until Oct. 9, for 100 sets of connecting rod bolts for use on Ford trucks.

The Vulcanite Roofing Co., Beaver Road, Buffalo, a subsidiary of the Beaverboard Companies, same address, has tentative plans under consideration for a branch plant at Atlanta, Ga.

Traveling cranes, freight-handling and conveying machinery, etc., will be installed at the new pier and warehouse to be constructed at the foot of McComas Street, Baltimore, by the Port Development Commission, estimated to cost about $3,000,000. It will be leased to the Western Maryland Railway Co., for a period of 20 years.

A vocational department will be installed in the proposed boys' high school at Macon, Ga., estimated to cost close to $200,000. Bonds for $500,000 have been approved.

The Chief of Air Service, United States Army, 1050 Munitions Building, Washington, will receive bids until Oct. 9 for 300 oil tanks for Curtiss airplanes, as specified in Circular 23-27.

The Battey Machine Co., West Second Avenue, Rome, Ga., is making inquiries for a belt-driven air compressor and a 50-hp. motor.

The Salisbury Ice Co., Salisbury, Md., has plans under way for enlargements in its railroad car icing plant, and the erection of a new plant, with capacity for handling about 6000 tons. A site for the latter plant has been acquired along the line of the New York, Philadelphia & Norfolk Railroad. Jesse D. Price is president.

City Manager Paul J. B. Murphy, Radford, Va., is making inquiries for electrical equipment, in connection with extensions and improvements in the municipal electric plant, to cost close to $25,000.

A vocational department will be installed in the new three-story and basement high school, 70 x 140 ft., to be erected at Newport News, Va., estimated to cost about $100,000. Charles M. Robinson, Times-Dispatch Building, Richmond, Va., is architect.

The Bureau of Supplies and Accounts, Navy Department, Washington, will receive bids until Oct. 10 for 200 engineers' wrenches for the Norfolk, Va., navy yeard, as specified in Schedule 193; until Oct. 17 for 7820 ft. of copper pipe for the Portsmouth, Va., Navy Yard, Schedule 185; and a miscellaneous quantity of copper pipe for the same yard, Schedule 186; also, until Oct. 24 for 100,000 ft. of bell wire for the Mare Island Navy Yard, San Francisco, Schedule 187.

James Reynolds, 819 Fourteenth Street, N. W., Washington, local agent for the Studebaker Automobile Co., has awarded a contract to Harry Waldman, 1430 K Street, N. W., for a three-story service and repair building, 75 x 100 ft., at Fourteenth and R Streets, N. W.

The Chief of Air Service, United States Army, Washington, will receive bids until Oct. 9, for 500 landing gear axles for aeroplanes, as specified in Circular 23-26.

The Broadfoot Iron Works, Wilmington, N. C., has awarded contract to Walter Clark, Wilmington, for a new two-story building to cost about $75,000.

The Wilson-Hock Co., City Point, Va., machinery dealer, is making inquiries for a 30 to 40 kw. belt-driven electric generator; motor-generator set, with 30-kw. generator and 50-hp. motor; other motors, starting equipment and kindred electrical apparatus.

A vocational department will be installed in the two-story high school at Westernport, Md., estimated to cost $100,000. M. C. Pederson, 824 North Charles Street, Baltimore, is architect.

The Carolina Washboard Co., Raleigh, N. C., has acquired property, 300 x 300 ft., at High Point, N. C. and plans the erection of a new one-story factory to occupy the entire site. Randolph Jordan is president.

Cleveland

CLEVELAND, Oct. 2.

THE machine-tool market generally is quiet although some of the dealers report an improvement in inquiries, mostly for single machines. The McMyler-Interstate Co., Bedford, Ohio, which is adding locomotive repair work to its regular line of products, which will necessitate the installation of considerable machinery, is understood to have about completed its machine tool purchases. H. J. Walker, formerly president H. J. Walker Co., Cleveland, is lining up equipment for a plant to manufacture automobile parts, which he and associates plan to start in Cleveland and for which some machinery has been purchased. It is expected that 20 or 30 machine tools will be required. Some single tool orders are coming from Cleveland automobile plants, but there is no activity in the Detroit automobile field. Outside of tools for replacement not much business is expected from the large automobile companies in the Michigan territory during the next few months. No new railroad inquiries are reported. Lists from the Chicago, Burlington & Quincy and the Missouri, Kansas & Texas railroads, including about one dozen turret lathes in which local builders are interested, are still pending. As a whole, machine tool business in September was disappointing.

The only new price change reported is an advance of about 10 per cent by the R. K. LeBlond Machine Tool Co. on its line of horizontal milling machines.

H. F. Seymour has purchased the Columbian Hardware plant of the Consolidated Iron & Steel Co., at East Fifty-third Street and Hamilton Avenue, Cleveland, the purchase including the buildings, equipment and inventory. The purchase price was approximately $550,000. Mr. Seymour, who was vice-president Consolidated company, has organized the Columbian Hardware Co. Other officers are E. Watkins, vice-president; A. V. Cannon, secretary, and H. M. Hitch, treasurer. The Columbian company will continue the manufacture of vises, anvils and drop forgings that have heretofore been made in this plant. The Consolidated Iron & Steel Co. will continue to operate the Republic Structural Iron Works and the Taylor & Boggis Foundry, two subsidiary organizations and will manufacture a few hardware items, including lock sets, springs and hinges.

The Stuko Steel Co., Cleveland, has been organized to manufacture light steel frame work for stucco dwelling houses and other buildings and has established a plant at East 104th Street and Harvard Avenue. Offices are at 2300 Euclid Avenue. S. P. Aldgridge is general manager.

The Cleveland Crane & Engineering Co. has recently taken the following orders for its tramrail equipment: The National Foundry Co., Brooklyn, N. Y., complete tramrail system for handling flasks; Standard Car Wheel Co., Cleveland, tramrail system including electric carrier and hoist for handling carwheels from the foundry floor to the soaking pits and from there to the cleaning room; Manning Paper Co., Fullerton, N. Y., tramrail system, including two carriers for handling hemp rope; Western Clock Co. LaSalle, Ill., tramrail system for window cleaning.

The Universal Smokeless Boiler Co., formerly at Wheeling, Va., is reported to be planning to locate in Akron, Ohio.

The Ohio-York Ice Machine Co., 1106 Woodland Avenue, Cleveland, is erecting a new plant on Bulkley Boulevard.

The Gulf States

BIRMINGHAM, Oct. 2.

AN appropriation of $3,000,000 for extensions and improvements has been arranged by the Dallas Power & Light Co., Dallas, Tex., to include the construction of an addition to its local generating plant, to increase the capacity about 15,000 kw. Other stations will be erected and line extensions made.

The Marathon Lumber Co., Laurel, Miss., has tentative plans for rebuilding its sawmill and lumber plant destroyed by fire Sept. 21, with loss of about $100,000, including machinery.

The McWane Cast Iron Pipe Co., Birmingham, has awarded contract to the Ingalls Iron Works, Birmingham, for the first unit of its new pipe foundry at East Birmingham, to be one-story, 105 x 340 ft. J. R. McWane is president.

The United States Engineer Office, Jacksonville, Fla., will take bids until Oct. 12 for a heavy oil engine and accessory equipment, as per specifications on file.

The Common Council, Tulia, Tex., is planning for extensions and improvements in the municipal electric power plant to cost about $25,000.

The Travis Cotton Seed Products Co., Hearne, Tex., is planning to rebuild the portion of its oil mill destroyed by fire Sept. 17, with loss estimated at $125,000 including machinery.

The City Council, Dallas, Tex., has accepted a proposition tendered by the Missouri, Kansas & Texas Railroad for the electrification of its line from Dallas to Denton, Tex., as a substitute for the construction of a new interurban electric line. The work will include the erection of new power plants, lines, etc., and is estimated to cost in excess of $400,000.

Temple Terraces, Inc., 801 Citrus Exchange Building, Tampa, Fla., V. W. Helm, secretary-treasurer, will take bids Oct. 10 on an electrically driven water supply pump of 250-gal.-per-min. capacity and on an electrically driven fire pump of 500-gal. capacity. On Oct. 12 bids are asked on 15,400 ft. of 3, 4 and 6-in. cast-iron pipe, new or second hand, and on 21,600 ft. of ¾ to 2-in. galvanized steel or iron pipe.

T. D. Whiteborn, Atlanta, Tex., and associates have acquired property at Sweetwater, Tex., and will commence the installation of equipment for a new plant to manufacture automobile truck bodies.

A vocational department will be installed in the new high school to be erected at Gadsden, Ala., 190 x 240 ft., estimated to cost $200,000, for which bids on a general contract will soon be called.

The sawmill, lumber plant and power house of the Peavy-Moore Lumber Co., Deweyville, Tex., was destroyed by fire Sept. 23, with loss of about $200,000 including machinery. It is planned to rebuild.

A vocational department will be installed in the new high school to be erected at Lampasas, Tex., for which bids on a general contract have just been received.

The Sinclair Pipe Line Co., Houston, Tex., a subsidiary of the Sinclair Consolidated Oil Corporation, 45 Nassau Street, New York, has plans under way for new pipe lines from Mexia to Houston, about 165 miles, with a capacity of 25,000 bbl. per day. The work will include the installation of three new electrically-operated pumping plants, with additions to a number of present pumping stations. A steel tank department for storage will also be constructed at Houston, with six 55,000-bbl. units. The work is estimated to cost in excess of $500,000. J. R. Manion is president.

A vocational department will be installed in the new high school to be erected at Hammond, La., for which bonds for $100,000 have been voted.

The Kosse Light & Power Co., Kosse, Tex., has arranged an appropriation of $25,000 for improvements in its power plant, including the installation of new machinery. H. E. Blumberg is owner and manager.

The Common Council, Gordo, Ala., has authorized the preparation of plans for the installation of a municipal electric light and power plant.

The Magnolia Petroleum Co., Electra, Tex., has staked out property for seven new buildings, including machine shop, forge shop, tool works, general repair shop, etc., to cost about $150,000. Work on the initial structures has commenced.

The Volusia Cypress Co., New Smyrna, Fla., has tentative plans under way for a new sawmill, planing mill and lumber plant, with power house, estimated to cost $100,000 with machinery.

Following the recent partial destruction by fire of the industrial building at Birmingham, occupied jointly by the Walstrum Armature Works, the Atlas Machinery & Supply

Co. and the Interstate Belting & Packing Co., with loss estimated at close to $40,000, the different companies are arranging for the re-establishment of their respective plants, with the installation of new equipment.

The Central South

ST. LOUIS, Oct. 2.

BIDS have been taken by the Broderick & Bascom Rope Co., 4600 North Main Street, St. Louis, for two new buildings at Brown Avenue and the Union Boulevard, estimated to cost $250,000, including machinery.

The Missouri Public Utilities Co., Cape Girardeau, Mo., has plans for extensions in its electric power plant and system in southern Missouri. The work is estimated to cost in excess of $250,000, with equipment. E. A. Hart is general manager.

The Du Bois Tube & Rubber Co., Chattanooga, Tenn., has plans under way for enlargements to double, approximately, the present capacity.

Vocational departments will be installed in the two new junior high schools to be erected at Enid, Okla., estimated to cost $200,000, for which foundations will be laid at once.

The Meridian Trail Garage, 1840 North Lawrence Street, Wichita, Kan., is planning for the installation of additional equipment in its repair department, including cylinder grinding apparatus, drill press, etc.

The Common Council, Milan, Mo., has plans for extensions and improvements in the municipal electric light and power house and the installation of additional equipment.

The Joyce-Watkins Co., 332 South Michigan Avenue, Chicago, manufacturer of railroad ties, etc., and its subsidiary organization, the Arrow Transportation Co., have tentative plans for the establishment of a boat and barge building works on property at Paducah, Ky., recently acquired. A marine railway will also be constructed.

The Scott Garage Co., South Douglas and Lincoln Streets, Wichita, Kan., is planning the installation of lathe, drill press and other tools. W. Scott heads the company.

The Tower Gasoline Co., Oklahoma City, Okla., is planning for the construction of a new oil refinery on site selected at Blackwell, Okla., to include a gasoline absorption plant. The refinery is reported to cost close to $100,000. L. Z. Harrison is general manager.

The Noble Coal & Lumber Co., Whick, Ky., recently organized, is planning for the construction of a power house on its coal properties, lately acquired. Electrical and mechanical mining equipment will also be installed. George W. Noble is president and general manager.

The Common Council, Vinita, Okla., will build a new power house on the Grand River, vicinity of Ketchum.

W. A. Dilano, Wichita, Kan., operating a wood-working plant at 235 Wabash Avenue, is planning the installation of a new planer, lathe, saw and other tools, also power transmission equipment.

The Knoxville Railway & Light Co., Knoxville, Tenn., has arranged an appropriation of $250,000 for extensions and improvements in its electric plant and system.

The Tipton Power & Light Co., Tipton, Okla., is planning the installation of new equipment, including a complete electric lighting set.

The National Refining Co., Tulsa, Okla., has plans under way for two new electrically-operated pumping plants, in connection with the extension of its oil pipe line from its refinery at Coffeyville, Kan.

The Kansas Electric Power Co., Kansas City, Mo., has disposed of a preferred stock issue of $1,000,000, the proceeds to be used for extensions.

A vocational department will be installed in the new high school to be erected at Ponca City, Okla., estimated to cost about $200,000, to replace the school recently destroyed by fire.

The R. C. Wayne Supply Co., 608 West Jefferson Street, Louisville, machinery dealer, has inquiries out for a 20-ton locomotive crane, 8-wheel, with reversible engine.

The board of directors, State Reformatory, Frankfort, Ky., has plans for an addition to the wood-working plant at the institution, 45 x 180 ft.

A new power plant will be constructed at the factory of the Spees Vinegar Co., Kansas City, Mo., at Fayetteville, Ark. It will also install a new hydraulic press, drying equipment and other mechanical apparatus.

The Oklahoma Gas & Electric Co., Oklahoma City Okla., is planning the erection of a new power house in the vicinity of Drumwright, Okla. It has commenced work on extensions and improvements in its plants and system to cost approximately $500,000.

The Pacific Coast

SAN FRANCISCO, Sept. 26.

THE C. F. BRAUN CO., 604 Mission Street, San Francisco, manufacturer of heaters, valves, etc., is completing plans for the second unit of its new plant at Shorb, Cal., two stories, 40 x 120 ft. John Reid, Jr., First National Bank Building, is architect.

The Little Rock Power & Water Co., Los Angeles, has been granted permission to construct a hydroelectric power plant on Little Rock Creek to cost about $300,000.

The Imperial Ice & Development Co., Calexico, Cal., will commence the immediate erection of an addition to its plant, estimated to cost $80,000. E. E. Anderson, assistant superintendent, is in charge.

The Chevrolet Motor Co., Detroit, is completing plans for a new two-story assembling plant, 145 x 685 ft., on Hillside Avenue, Oakland, Cal., estimated to cost in excess of $500,000, including machinery. Albert Kahn, 1000 Marquette Building, Detroit, is architect.

The Pacific Ready-Built Homes, Inc., Los Angeles, has tentative plans for an addition to cost about $150,000. The equipment will include several electrically operated loading cranes. Berne S. Barker is secretary.

The Pacific Gas & Electric Co., 445 Sutter Street, San Francisco, has tentative plans for the construction of seven hydroelectric generating plants on the Pit River to develop a total capacity of 600,000 hp. and estimated to cost in excess of $80,000,000, with machinery and transmission lines. Initial work has commenced on the first power plant.

The Washington Iron Works, Seattle, Wash., has awarded a contract to the Austin Co., Smith Building, for a one-story foundry, totaling about 65,000 sq. ft. of floor area.

The Nephi Plaster & Mfg. Co., Nephi, Utah, has plans under way for enlargements in its plaster mill and cement works. The equipment will include crushing and fine-grinding machinery, electric and power equipment, etc.

The Hebern Electric Co., Bank of Italy Building, San Francisco, manufacturer of electrical equipment, has awarded contract to the P. J. Walker Co., Monadnock Building, for a new three-story plant, 100 x 200 ft., at Harrison and Eighth Streets, Oakland, Cal., to cost about $150,000, including equipment.

The Skamania Light & Power Co., Stevenson, Wash., will commence the immediate erection of a new hydroelectric power plant on Hermon Creek, estimated to cost in excess of $150,000.

The Puget Sound Lumber & Box Co., 3725 Twelfth Avenue, Seattle, Wash., is completing plans for a new two-story factory, 50 x 210 ft., at 1201 East Northlake Avenue. A list of machinery will be prepared at an early date.

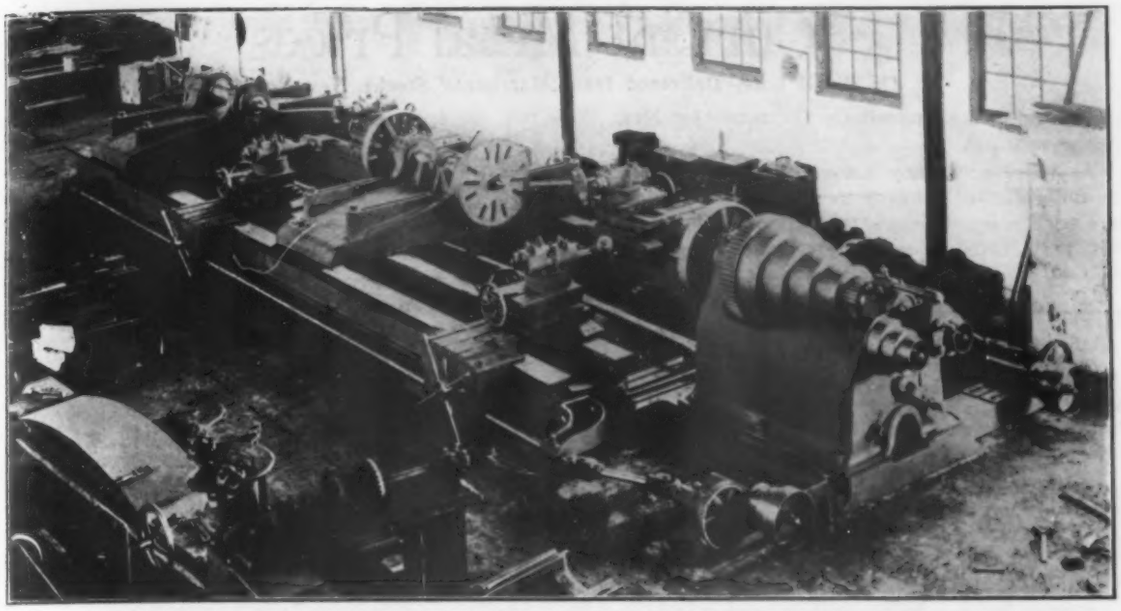
The Spokane Valley Irrigation District, Spokane, Wash., will install hydraulic turbine and auxiliary apparatus, two centrifugal pumps, electrical and other power machinery, in connection with a new irrigation project to cost $500,000. R. K. Tiffany, Old National Bank Building, is engineer.

Canada

TORONTO, Oct. 2.

MACHINE tool sales have been light during the week, but there is considerable prospective business in sight and a fair amount appears to be on the point of closing. The demand for wood-working equipment continues to keep the lead over that for iron working lines, but the latter is beginning to take on a brighter aspect and with the Canadian railroads entering the market much heavier buying is expected. In many lines prices have been showing more strength and advances have been common of late. The coal situation has recently developed changes for the better and the outlook is becoming brighter and supplies from across the border are making their appearance in larger volume. The announcement of new plant construction, together with additions which are under way or about to be started, are promising features of this market. Activities among automotive plants continue steady and while demand from this source has fallen off slightly the past month, a limited amount of buying continues. A steady demand prevails for small tools and buying is reported both for spot and future use.

Officials of the Eugene Phillips Electrical Works, Montreal, announce that construction will start at an early date on the erection of the second unit to the plant at Brockville, Ont., the power cable mill. The company is installing equip-



This Lathe, Which Was Built by the F. R. Patch Mfg. Co., Maker of Heavy Duty Machinery, Rutland, Vt., Is 47 Ft. 1 In. Long, Is Supplied with a Center Stock Which Allows Two Articles to Be Turned at One Time and It Has an Extreme Width, When the Beds Are Extended the Maximum Distance, of 16 Ft. 2 In. The machine was built for the George A. Fuller Co., to manufacture columns at Stonington, Me., granite quarries for use in the New York County Court House, and of course a feature is that two sections of the granite columns may be turned at one time. The weight of the finished machine is 122,000 lb.

ment in the first unit and expects to commence operations soon.

The Premier Paper & Power Co., Hartville, N. S., proposes to install a standard newsprint machine in its plant. To provide the necessary power it will develop an additional 5000 hp.

The Thunder Bay Co., Port Arthur, Ont., proposes to increase the capacity of its groundwood pulp mill to 100 tons per day. It is also considering the erection of a paper mill unit.

The Canada Electric Castings Co., Ltd., Orillia, Ont., is completing the erection of new plant, 50 x 350 ft., which is expected to be in operation within the next few weeks. It is proposed to use 200 ft. of the building for steel and iron work and the remaining 150 ft. will be equipped for a brass foundry. Equipment being installed includes two 3-ton electric Heroult type furnaces, two shaft furnaces and ten crucible furnaces. About 50 men will be employed when capacity is reached. J. B. Tudhope is president and A. H. R. Burrows, vice-president and general manager.

The Nashwaak Pulp & Paper Co., Ltd., St. John, N. B., is reconstructing nearly every department of its plant and is installing new equipment in many departments with the intention of increasing the capacity from 60 to 80 tons of pulp per day.

The Hayes Wheel Co. of Canada, Ltd., Chatham, Ont., which recently took over the plant of General Forgings & Stampings, Ltd., at Merritton, Ont., is installing equipment for the manufacture of outside automobile rims. It is also transferring the metal stamping equipment to the Chatham plant. The forge plant will not be disturbed, but the business will be increased.

In the improvements being made to the plant of the Canada Cement Co., Lakefield, Ont., arrangements are being made for the development of electrical power from heat. The waste heat from the kilns, instead of being allowed to escape through flues as formerly, will pass around boilers and produce low pressure steam for the operation of engines and generators. The old plant is being demolished and a new one erected, which is expected to be completed and in operation within a year.

The Canadian Paper Board Co., Montreal, proposes to spend considerable money on new equipment for its plants at Montreal, Frankford and Campbellford, with the intention of increasing the capacity from 30,000 to 40,000 tons per annum. Improvements will be made to the boiler plant, hydroelectric installation, finishing departments as well as installing new paper machine and other equipment.

McDougall & McNeill, Ltd., Vancouver, B. C., have been awarded the general contract for the first unit of a pulp and paper plant at Elko, B. C., for the Wigwam Pulp & Paper Co., Ltd., which, when completed, will represent an expenditure of $13,000,000.

IRON AND INDUSTRIAL STOCKS

Rumors of War Have Depressing Effect on Many Securities

Pronounced irregularity prevailed throughout the week in steel and industrial stocks, owing to a series of apprehensions, chief of which was the rumor of war, which is now viewed as improbable. The general trend for the week was uniformly downward. Some buying of importance was noted, especially in U. S. Steel common. Beginning erratic on Monday, sharp declines were suffered on Tuesday and Wednesday; then came a rally which ended in another decline. Acute reactions brought considerable buying varied with periods of dullness when prices merely sagged. Friday's recovery was the only one of note, U. S. Steel leading with a two-point rise. The average of 20 industrial stocks was 97.3, more than 1½ below last week. At Saturday's close, the more active stocks sold off from one to three points. The decline in some quarters is regarded more as a seasonal evolution and the outlook is said to be encouraging.

	Low	High		Low	High
Allis-Chalmers ..	53½	56	Gt. No. Ore Cert.	38⅞	39⅝
Allis-Chal. pf....	101	103	Gulf States Steel	83	94⅝
Am. B. S. & Fdy.	76	77½	Inland Steel ...	47	48
Am. B.S. & F. pf.	110⅝	110⅝	Int. Har., new..	105¼	109½
Am. Can	56⅝	60½	Int. H. pf., new.	119	119
Am. Can pf.....	109	109⅝	Lackawanna St..	76⅛	82⅛
Am. Car & Fdy..	182¼	188½	Lima Loco.	56⅝	60½
Am. C. & F. pf..	122	122	Midvale Steel...	30⅝	35⅝
Am. Loco.	120½	125¾	National-Acme..	14½	14⅝
Am. Loco. pf....	119	119	Nat. En. & Stm..	60	63⅝
Am. Radiator...	118⅜	124⅜	Nova Scotia Steel	34	36
Am. Steel Fdries.	42⅜	44⅞	Otis Steel	10½	11
Am. St. Fd. pf..	104	104⅛	Otis Steel pf....	54½	55
Bald. Loco.	130⅞	135⅝	Pressed St. Car..	85	90½
Bald. Loco. pf...	115¼	115¼	Press. St. Car pf.	105	105
Beth. Steel	70	76	Ry. Steel Spring.	117	117½
Beth. St. Class B	69⅝	76¼	Replogle Steel...	32⅛	35
Beth. St. 8% pf..	111	112	Republic	54½	67½
Brier Hill	17⅜	20	Republic pf.....	85	91½
Br. Em. St. 1 pf.	74	74	Sloss Sheffield...	77	77
Br. Em. St. 2 pf.	33½	34½	Steel of Canada..	72½	77
Cambria Steel...	40	40	Superior Steel...	31¼	35
Chic. Pneu. Tool	78	82½	Un. Alloy Steel..	37½	37⅝
Colorado Fuel...	32	34½	U. S. Steel.....	100⅝	104⅛
Crucible Steel...	81⅝	90¼	U. S. Steel pf...	121½	122¾
Crucible St. pf..	95	95⅝	Vanadium Steel.	43⅝	49½
Gen. Electric....	173½	179½	Va. I., C. & Coke	55	55½
Gen. Electric 6%	11⅝	12	W'house Air Br.	100	103

Steel Corporation Stockholders

The United States Steel Corporation reports 96,307 common stockholders on its books, according to the record taken in connection with the mailing of the dividend checks for the current quarter. This is a reduction of 3,205 in the past three months and a decrease of 11,132 from the record figure reported for all the time, the total of 107,439 reached at the close of last year. The number of stockholders on the books at the present time is the smallest since the last quarter of 1920, but it is larger than any total reported prior to 1921.

Current Metal Prices

On Small Lots, Delivered from Merchants' Stocks, New York City

The following quotations are made by New York City warehouses.

As there are many consumers whose requirements are not sufficiently heavy to warrant their placing orders with manufacturers for shipments in carload lots from mills, these prices are given for their convenience.

On a number of articles the base price only is given, it being impossible to name every size.

The wholesale prices at which large lots are sold by manufacturers for direct shipment from mills are given in the market reports appearing in a preceding part of THE IRON AGE under the general heading of "Iron and Steel Markets" and "Non-ferrous Metals."

Iron and Soft Steel Bars and Shapes

Bars:	
Refined iron bars, base price	3.04c.
Swedish bars, base price	7.50c.
Soft steel bars, base price	3.04c.
Hoops, base price	4.39c.
Bands, base price	3.84c.
Beams and channels, angles and tees 3 in. x ¼ in. and larger, base	3.14c.
Channels, angles and tees under 3 in. x ¼ in., base	3.04c.

Merchant Steel

	Per Lb.
Tire, 1½ x ½ in. and larger	3.10c.
(Smooth finish, 1 to 2½ x ¼ in. and larger)	3.30c.
Toe-calk, ½ x ⅜ in. and larger	4.15c.
Cold-rolled strip, soft and quarter hard	6.75c. to 7.25c.
Open-hearth spring steel	4.50c. to 7.00c.
Shafting and Screw Stock:	
Rounds	3.90c.
Squares, flats and hex	4.40c.
Standard cast steel, base price	15.00c.
Extra cast steel	18.00c.
Special cast steel	23.00c.

Tank Plates—Steel

¼ in. and heavier	3.14c.

Sheets

Blue Annealed

	Per Lb.
No. 10	4.19c.
No. 12	4.24c.
No. 14	4.29c.
No. 16	4.39c.

Box Annealed—Black

	Soft Steel C. R., One Pass, Per Lb.	Blued Stove Pipe Sheet, Per Lb.
Nos. 18 to 20	4.30c. to 4.70c.	.....
Nos. 22 and 24	4.35c. to 4.75c	5.00c.
No. 26	4.40c. to 4.80c.	5.05c.
No. 28	4.50c. to 4.90c.	5.15c.
No. 30	4.75c. to 5.15c.	.....

No. 28 and lighter, 36 in. wide, 10c. higher

Galvanized

	Per Lb.
No. 14	4.60c. to 5.00c.
No. 16	4.75c. to 5.15c.
Nos. 18 and 20	4.90c. to 5.30c.
Nos. 22 and 24	5.05c. to 5.45c.
No. 26	5.20c. to 5.60c.
No. 27	5.35c. to 5.75c.
No. 28	5.50c. to 5.90c.
No. 30	6.00c. to 6.40c.

No. 28 and lighter, 36 in. wide, 20c. higher.

Welded Pipe

Standard Steel	Black	Galv.	*Wrought Iron*	Black	Galv.
⅛ in. Butt..	—53	—38	⅛ in. Butt...	—11	+13
¼ in. Butt..	—58	—45	¼ in. Butt...	—17	— 1
1-3 in. Butt ..	—60	—47	1-1½ in. Butt.	—20	— 2
2½-6 in. Lap.	—57	—44	2 in. Lap....	—14	+ 2
7-8 in. Lap..	—53	—30	2½-6 in. Lap.	—18	— 2
9-12 in. Lap.	—49	—30	7-12 in. Lap..	—10	+ 6

Steel Wire

BASE PRICE* ON No. 9 GAGE AND COARSER	Per Lb.
Bright basic	4.00c. to 4.25c.
Annealed soft	4.00c. to 4.25c.
Galvanized annealed	4.65c. to 4.90c.
Coppered basic	4.65c. to 4.90c.
Tinned soft Bessemer	5.65c. to 5.90c.

*Regular extras for lighter gage.

Brass Sheet, Rod, Tube and Wire

BASE PRICE

High brass sheet	19¼c. to 20¼c.
High brass wire	20¼c. to 20¾c.
Brass rod	16¾c. to 17¾c.
Brass tube, brazed	26¼c. to 27¼c.
Brass tube, seamless	23 c. to 23½c.
Copper tube, seamless	25¾c. to 26 c.

Copper Sheets

Sheet copper, hot rolled, 24 oz., 22¾c. to 23¾c. per lb. base.

Cold rolled, 14 oz. and heavier, 3c. per lb. advance over hot rolled.

Tin Plates

Bright Tin: Grade "AAA" Charcoal 14x20	Grade "A" Charcoal 14x20	Coke—14-20:	Primes	Wasters
		80 lb.	$6.05	$5.80
		90 lb.	6.15	5.90
		100 lb.	6.25	6.00
IC	$10.00	IC	6.40	6.15
IX	11.50	IX	7.40	7.15
IXX	13.00	IXX	8.40	8.15
IXXX	14.25	IXXX	9.40	9.15
IXXXX	16.00	IXXXX	10.40	10.15

Terne Plates

8-lb. coating, 14 x 20

100 lb.	$7.00
IC	7.25
IX	7.50
Fire door stock	9.00

Tin

Straits, pig	36c.
Bar	43c. to 47c.

Copper

Lake ingot	15¼c.
Electrolytic	15 c.
Casting	14¾c.

Spelter and Sheet Zinc

Western spelter	8½c.
Sheet zinc, No. 9 base, casks	9¼c. open 9¾c.

Lead and Solder*

American pig lead	6¾c. to 7c.
Bar Lead	8c. to 8½c
Solder, ½ and ½ guaranteed	25c.
No. 1 solder	23½c.
Refined solder	20¼c.

*Prices of solder indicated by private brand vary according to composition.

Babbitt Metal

Best grade, per lb	75c.
Commercial grade, per lb	35c.
Grade D, per lb	25c.

Antimony

Asiatic	7c. to 8c.

Aluminum

No. 1 aluminum (guaranteed over 99 per cent pure), in ingots for remelting, per lb	25c. to 27c.

Old Metals

The market is stronger and business more active. Dealers' buying prices are as follows:

	Cents Per Lb.
Copper, heavy crucible	12.00
Copper, heavy wire	11.50
Copper, light and bottoms	9.50
Brass, heavy	6.25
Brass, light	5.25
Heavy machine composition	8.50
No. 1 yellow brass turnings	6.50
No. 1 red brass or composition turnings	8.00
Lead, heavy	5.00
Lead, tea	4.00
Zinc	3.75